DUAL FUEL ADD-ON HEAT PUMP GUIDE FOR OPERATIONAL COST SAVINGS

REGION 4

BARD MANUFACTURING COMPANY, BOX 607, BRYAN, OHIO 43506

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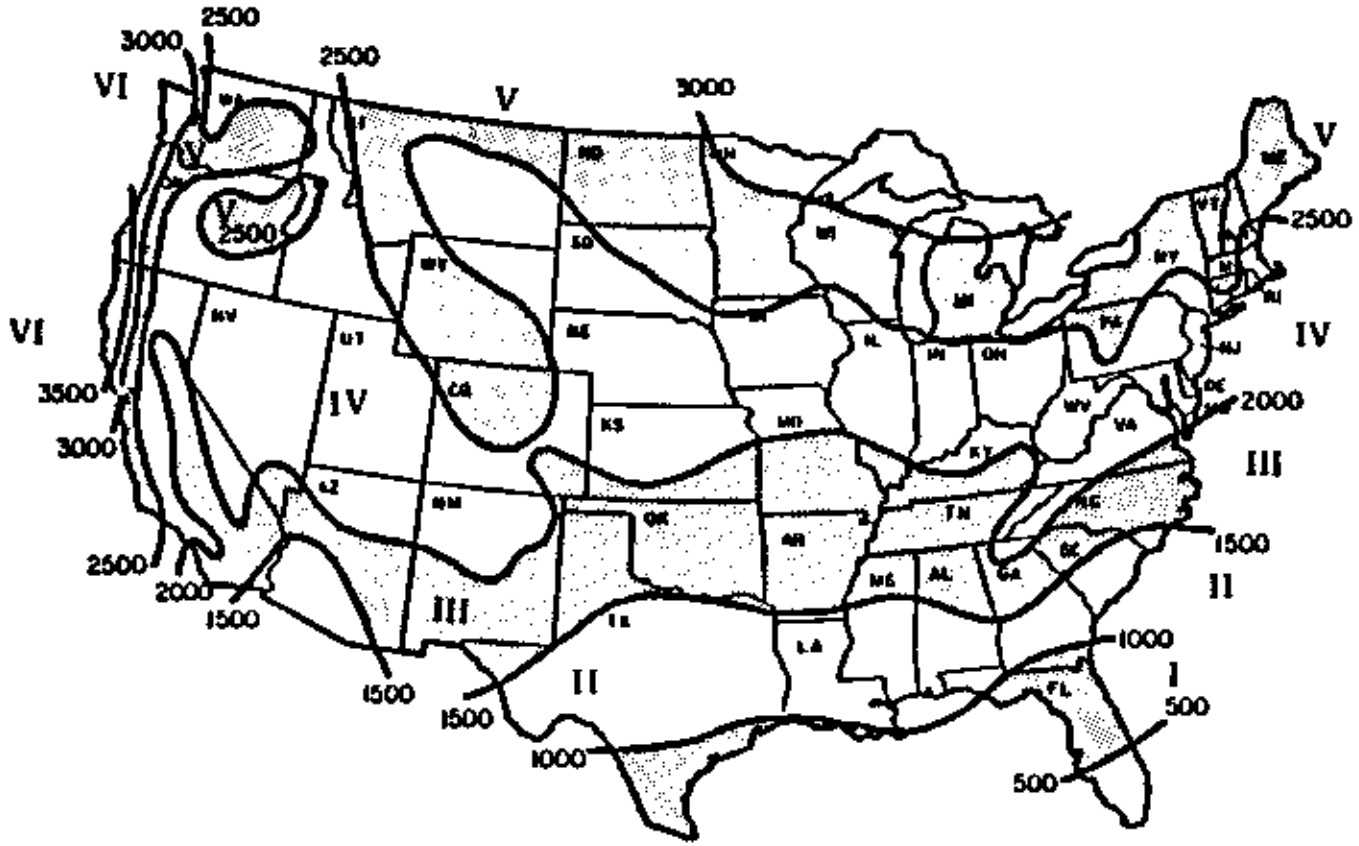
MANUAL 2100-072 REV. C
SUPERSEDES REV.



REGION HEATING LOAD HOURS

Region	HLHr
I	750
II	1250
III	1750
IV	2250
V	2750
VI	2750

This map is reasonably accurate for the most parts of the United States but is necessarily highly generalized and consequently not too accurate in mountainous regions, particularly in the Rockies.

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GENERAL DESCRIPTION

WHAT DOES THIS GUIDE SHOW?

This operational cost savings guide has been prepared to show theoretical cost savings for Bard dual fuel "add-on" heat pumps when used with either existing or new furnaces. It covers add-on applications for electric, oil, propane gas and natural gas type forced air furnaces. It includes both air source heat pumps and ground water source heat pumps at many combinations of gas, oil and electrical rates. It enables the user not only to make a theoretical operating cost comparison at today's fuel costs but also at future estimated higher energy costs.

It is important to understand that this is a theoretical comparison between fuels. Actual operation costs can vary depending on many difficult to predict variables such as the actual design heating or cooling load, air infiltration, and wind effects, solar effect, efficiency of existing furnace, severity of weather for a given heating or cooling season and also individual usage pattern.

SPECIAL FEATURE--FUEL SAVER MODULE

These estimates utilize the Bard Fuel Saver Module which permit the heat pump to operate below the balance point to maximize the energy savings. For each application an analysis should be made to determine the economic balance point which is the outdoor temperature at which it becomes more cost effective to shut the heat pump down with an outdoor thermostat. This temperature varies with each combination of fuel cost and furnace and heat pump efficiency level. Refer to tables included in the instructions with the Fuel Saver Module.

FURNACE EFFICIENCY

For purposes of these cost estimates, furnace efficiency levels of 100% AFUE for electric, 78% AFUE for natural and propane gas and 78% AFUE for oil was chosen. We recognize that any variation in efficiency from these values will change the operating cost somewhat. These values were chosen to best represent typical efficiency levels of most equipment in the field today.

HOW TO USE DUAL FUEL ADD-ON

HEAT PUMP GUIDE TO ENERGY COST SAVINGS

1. Determine the heating Btuh loss and cooling Btuh gain for structure using a Bard "Whole-House Heat Loss and Gain Work Sheet," Form B008, ACCA "Load Calculation," Manual J.

   a. Heating house Btuh loss is _____ .

   b. Cooling house Btuh gain is _____ .

2. Determine the type of fuel available at structure (what type of {fuel} heating system is already there).

   a. Electricity
   b. Natural Gas
   c. Propane Gas
   D. Fuel Oil
   E. Good water supply and disposal

3. Call local utilities and determine area energy costs.

   a. Electricity _____ $Kilowatt-hour

   b. Natural Gas _____ $/Therm

   c. Propane Gas _____ $/Gallon

   d. Fuel Oil _____ $/Gallon

4. Tentatively select an add-on heat pump system using Bard Manual 2100-057, "Heat Pump Sizing" as a guide, and a Bard equipment catalog.

   a. ~ to air heat pump

      Model _____ Indoor Coil _____

      Btuh _____ Heat Btuh _____ Cool

   b. Water to air

      Model _____ Indoor Coil _____

      Btuh _____ Heat Btuh _____ Cool

5. Determine heating region where the structure is located. To do this, find the geographic location of house on regional heating load hours map. A map is located inside the front cover of this guide.

   A. Region structure is located _____ .

YOU ARE NOW READY TO USE THE "DUAL FUEL ADD-ON HEAT PUMP GUIDE"

6. Select the "Dual Fuel Add-On Heat Pump Guide" for the region the structure is located. (See step 5 above.)

7. Locate the add-on heat pump model or models you tentatively selected (Step 4) in the "Guide." Refer to Table of Contents.

EXAMPLE: 36UHPQA w/A36AQ-A Indoor Coil

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95°) 35000, SEER 8.69

ARI RATED HEATING CAP.: BTUH (47°) 33600, COP(47°) 2.90, HSPF 8.90 MIN.DHR REQ IV

BTUH (17°) 20000, COP(17°) 2.20

8. Now locate the furnace type by fuel used (Step 2).

EXAMPLE: A fuel oil furnace with AFUE of 78%.

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

9. You now have located the page or pages that will help you determine annual operating cost. See example--Figure 1.

A. Locate the closest structure loss in Btuh column on left side of page (step 1).

EXAMPLE: 70,000 Btuh Heat Loss

B. Locate the heating cost per unit at top of page (step 3).

EXAMPLE: $1.40 per gallon fuel oil

C. Now read down the fuel cost column until directly across from the structure heat loss in Btuh. This will be the theoretical annual heating cost using only the furnace.

EXAMPLE: 70,000 Btuh heat loss @ $1.40 per gallon fuel oil, the annual cost will be $1,568.

D. Next locate the electric cost $/KW under Heat Loss Btuh for structure (step 3).

EXAMPLE: $.06 KW rate

E. Now once again read down the fuel cost column until directly across from electric cost $/KW. You now have located the annual heating cost for the house using an add-on heat pump with the furnace.

EXAMPLE: 70,000 Btuh structure heat loss, with $.06 KW cost and $1.40 per gallon fuel oil. The annual cost using a 36UHPQA Bard heat pump with the oil furnace would be $1,292 for an annual savings of $276 ($1,568 minus $1,292).

Now repeat steps 8 through 9 for each type fuel and/or heat pump selected. This will enable you to select the best combination of furnace and heat pump to use for a structure.

10. The balance point (the outdoor temperature at which the heat pump is running 100% of the time and just meeting structure heat loss requirements) is located on right side of page.

EXAMPLE: For a structure with a 70,000 Btuh with a 36UHPQA heat pump has a balance point of 36°F. Below this theoretical balance point, the heating load is automatically transferred between the heat pump and the furnace by the wall thermostat to maintain the desired temperature. This is accomplished with the Fuel Saver Module.

70,000	$	784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	$	767	835	902	970	1032	1100	1168	1235	1303	1371	1438	1500	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
.06	$	823	891	959	1026	1089	1156	1224	1291	1359	1427	1495	1557	
.07	$	882	953	1021	1089	1157	1218	1286	1354	1421	1489	1557	1619	
.08	$	942	1010	1077	1145	1207	1275	1342	1410	1478	1546	1613	1675	
.09	$	1004	1072	1139	1207	1269	1337	1405	1472	1540	1608	1675	1737	
.10	$	1060	1128	1196	1263	1326	1393	1461	1529	1596	1664	1732	1794	
.12	$	1179	1247	1314	1382	1444	1512	1579	1647	1715	1783	1850	1912	
.14	$	1297	1366	1433	1500	1563	1630	1698	1766	1833	1901	1969	2031	
.16	$	1416	1484	1551	1619	1681	1749	1816	1884	1952	2020	2087	2149	

BALANCE POINT 36 DEG.F. ~10

11. To find annual cooling cost of heat pump, look at the bottom of page under annual air conditioning cost. Directly under the electric rate $/KW (step 3) line, is located the annual cooling cost.

EXAMPLE: At .06 $/KW rate for electricity, the cooling cost would be $182.00 annually.

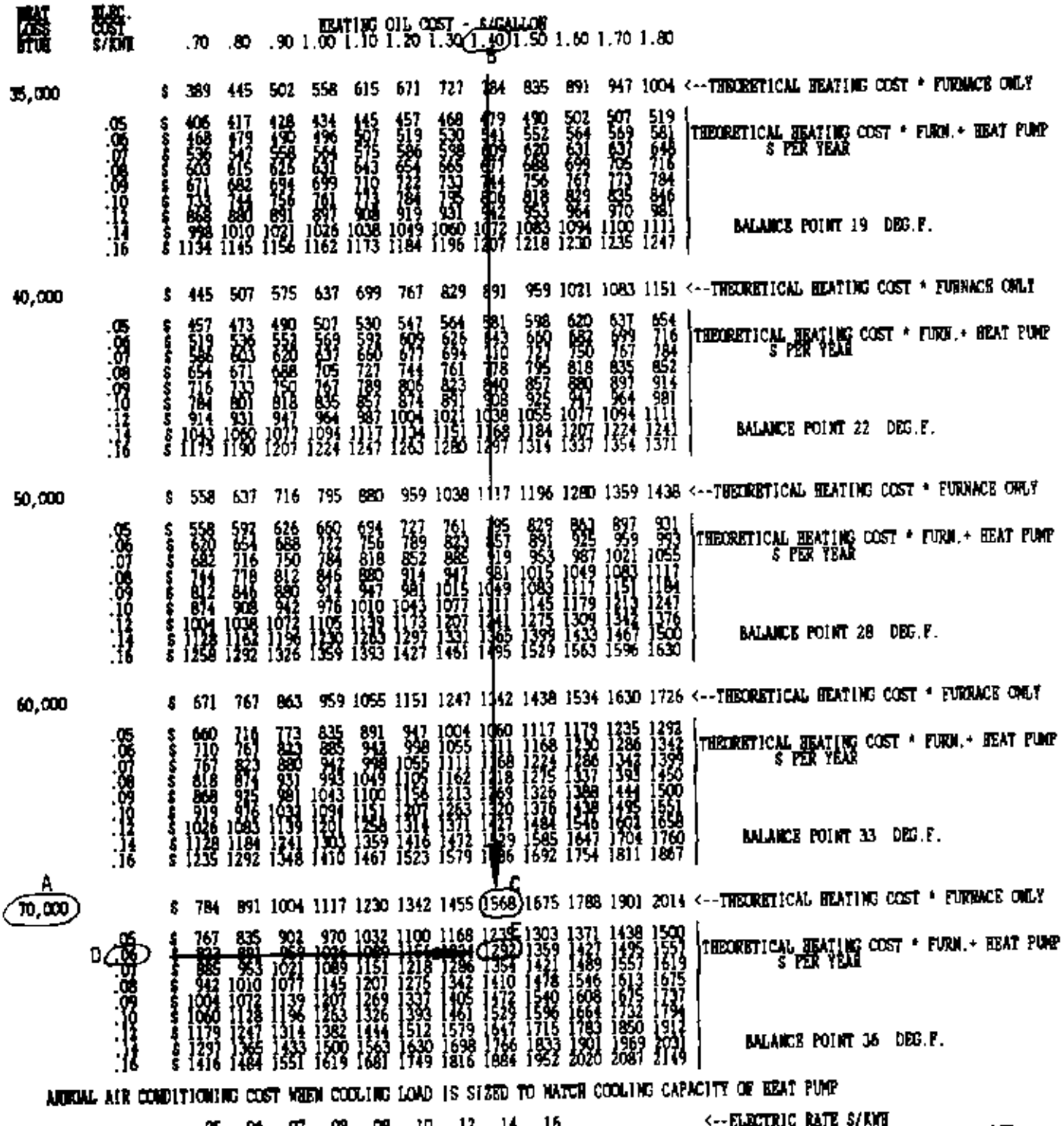
ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	151	182	212	243	273	303	364	425	486	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

NOTE: The accuracy of the "Dual Fuel-Add-On Heat Pump Guide to Energy Cost Savings," is directly affected by how accurately you estimate the structure's heat loss and heat gain in step 1. Because of uncontrollable variables, Bard Manufacturing Company is not responsible for any variation in actual operating costs from these theoretical estimates.

FIGURE 1



HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
35,000		$ 389	445	502	558	615	671	727	784	840	896	953	1009	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 406	417	428	434	445	457	468	479	490	502	507	519	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 468	479	490	496	507	519	530	541	552	564	569	581	
	.07	$ 530	547	558	564	575	586	598	609	620	631	637	648	
	.08	$ 603	615	626	631	643	654	665	677	688	699	705	716	
	.09	$ 671	682	694	699	710	722	733	744	756	767	773	784	
	.10	$ 733	744	756	761	773	784	795	806	818	829	835	846	
	.12	$ 868	880	891	897	908	919	931	942	953	964	970	981	
	.14	$ 998	1010	1021	1026	1038	1049	1060	1072	1083	1094	1100	1111	BALANCE POINT 19 DEG.F.
	.16	$ 1134	1145	1156	1162	1173	1184	1196	1207	1218	1230	1235	1247	
40,000		$ 445	507	575	637	699	767	829	891	959	1031	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 457	473	490	501	530	547	564	581	598	620	637	654	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 519	536	553	569	593	609	626	643	660	682	699	716	
	.07	$ 582	603	620	637	660	677	694	710	727	750	767	784	
	.08	$ 654	671	688	705	727	744	761	778	795	818	835	852	
	.09	$ 716	733	750	767	789	806	823	840	857	880	897	914	
	.10	$ 784	801	818	835	857	874	891	908	925	947	964	981	
	.12	$ 914	931	947	964	987	1004	1021	1038	1055	1077	1094	1111	
	.14	$ 1043	1060	1077	1094	1117	1134	1151	1168	1184	1207	1224	1241	BALANCE POINT 22 DEG.F.
	.16	$ 1175	1190	1207	1224	1247	1263	1280	1297	1314	1337	1354	1371	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 558	592	626	660	694	727	761	795	829	863	897	931	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 620	654	688	722	756	789	823	857	891	925	959	993	
	.07	$ 682	716	750	784	818	852	885	919	953	987	1021	1055	
	.08	$ 744	778	812	846	880	914	947	981	1015	1049	1083	1117	
	.09	$ 812	846	880	914	947	981	1015	1049	1083	1117	1151	1184	
	.10	$ 874	908	942	976	1010	1043	1077	1111	1145	1179	1213	1247	
	.12	$ 1004	1038	1072	1105	1139	1173	1207	1241	1275	1309	1342	1376	
	.14	$ 1128	1162	1196	1230	1263	1297	1331	1365	1399	1433	1467	1500	BALANCE POINT 28 DEG.F.
	.16	$ 1258	1292	1326	1359	1393	1427	1461	1495	1529	1563	1596	1630	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 660	716	773	835	891	947	1004	1060	1117	1179	1235	1292	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 710	767	823	885	942	998	1055	1111	1168	1230	1286	1342	
	.07	$ 767	823	880	942	998	1055	1111	1168	1224	1286	1342	1399	
	.08	$ 818	874	931	993	1049	1105	1162	1218	1275	1337	1393	1450	
	.09	$ 868	925	981	1043	1100	1156	1213	1269	1326	1388	1444	1500	
	.10	$ 919	976	1032	1094	1151	1207	1263	1320	1376	1438	1495	1551	
	.12	$ 1026	1083	1139	1201	1258	1314	1371	1427	1484	1546	1603	1659	
	.14	$ 1128	1184	1241	1303	1359	1416	1472	1529	1585	1647	1704	1760	BALANCE POINT 33 DEG.F.
	.16	$ 1235	1292	1348	1410	1467	1523	1579	1636	1692	1754	1811	1867	
A 70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 767	835	902	970	1032	1100	1168	1235	1303	1371	1438	1500	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
D	.06	$ 822	891	959	1026	1089	1157	1224	1292	1359	1427	1495	1557	
	.07	$ 885	953	1021	1089	1151	1218	1286	1354	1421	1489	1557	1619	
	.08	$ 942	1010	1077	1145	1207	1275	1342	1410	1478	1546	1613	1675	
	.09	$ 1004	1072	1139	1207	1269	1337	1405	1472	1540	1608	1675	1737	
	.10	$ 1060	1128	1196	1263	1326	1393	1461	1529	1596	1664	1732	1794	
	.12	$ 1179	1247	1314	1382	1444	1512	1579	1647	1715	1783	1850	1913	
	.14	$ 1297	1365	1433	1500	1563	1630	1698	1766	1833	1901	1969	2031	BALANCE POINT 36 DEG.F.
	.16	$ 1416	1484	1551	1619	1681	1749	1816	1884	1952	2020	2087	2149	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	151	182	212	243	273	300	364	425	486	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL:COMPRESSOR SECTION W0S30A INDOOR A36A0-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 30770 BTUH,16.34 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 41700 BTUH, 3.62 COP
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS BTUH — ELEC. COST $/KWH

30,000 — THEORETICAL ANNUAL HEATING COST —

$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.05	253	756
.06	299	908
.07	349	1060
.08	400	1213
.09	451	1365
.10	496	1517
.12	603	1822
.14	705	2127
.16	801	2431

BALANCE POINT 7- DEG.F.

35,000 — THEORETICAL ANNUAL HEATING COST —

$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.05	287	885
.06	344	1060
.07	400	1241
.08	457	1416
.09	519	1596
.10	575	1771
.12	688	2127
.14	806	2482
.16	919	2838

BALANCE POINT 3 DEG.F.

40,000 — THEORETICAL ANNUAL HEATING COST —

$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.05	321	1010
.06	389	1213
.07	451	1416
.08	519	1619
.09	581	1822
.10	648	2025
.12	778	2431
.14	914	2838
.16	1038	3244

BALANCE POINT 11 DEG.F.

50,000 — THEORETICAL ANNUAL HEATING COST —

$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.05	417	1263
.06	502	1517
.07	586	1771
.08	671	2025
.09	756	2279
.10	840	2533
.12	1004	3041
.14	1173	3549
.16	1337	4057

BALANCE POINT 22 DEG.F.

60,000 — THEORETICAL ANNUAL HEATING COST —

$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.05	547	1517
.06	654	1822
.07	767	2127
.08	874	2431
.09	981	2736
.10	1094	3041
.12	1309	3650
.14	1523	4260
.16	1743	4869

BALANCE POINT 29 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

<--ELECTRIC RATE $/KWH	.05	.06	.07	.08	.09	.10	.12	.14	.16
<--THEORETICAL AIR CONDITIONING COST $	75	90	105	120	135	150	180	210	241

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COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 30770 BTUH, 16.34 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 27710 BTUH, 3.62 COP
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH		NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
30,000		$	231	265	299	332	361	394	428	462	496	530	598	665	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	248	248	248	248	248	248	248	248	248	248	248	253	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	293	293	293	293	293	293	293	293	293	293	293	299	
	.07	$	344	344	344	344	344	344	344	344	344	344	344	349	
	.08	$	389	389	389	389	389	389	389	389	389	389	389	394	
	.09	$	440	440	440	440	440	440	440	440	440	440	440	445	
	.10	$	485	485	485	485	485	485	485	485	485	485	485	490	
	.12	$	581	581	581	581	581	581	581	581	581	581	581	586	
	.14	$	677	677	677	677	677	677	677	677	677	677	677	682	BALANCE POINT 7- DEG.F.
	.16	$	778	778	778	778	778	778	778	778	778	778	778	784	
35,000		$	270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	276	276	282	282	282	282	282	282	287	287	287	287	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	332	332	338	338	338	338	338	338	344	344	344	344	
	.07	$	389	389	394	394	394	394	394	394	400	400	400	400	
	.08	$	440	440	445	445	445	445	445	445	451	451	451	451	
	.09	$	496	496	502	502	502	502	502	502	507	507	507	507	
	.10	$	552	552	558	558	558	558	558	558	564	564	564	564	
	.12	$	660	660	665	665	665	665	665	665	671	671	671	671	
	.14	$	767	767	773	773	773	773	773	773	778	778	778	778	BALANCE POINT 3 DEG.F.
	.16	$	874	874	880	880	880	880	880	880	885	885	885	885	
40,000		$	310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	315	321	321	321	327	327	332	332	338	338	344	349	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	372	378	378	378	383	383	389	389	394	394	400	406	
	.07	$	434	440	440	440	445	445	451	451	457	457	462	468	
	.08	$	490	496	496	496	502	502	507	507	513	513	519	524	
	.09	$	552	558	558	558	564	564	569	569	575	575	581	586	
	.10	$	609	615	615	615	620	620	626	626	631	631	637	643	
	.12	$	727	733	733	733	739	739	744	744	750	750	756	761	
	.14	$	846	852	852	852	857	857	863	863	868	868	874	880	BALANCE POINT 11 DEG.F.
	.16	$	964	970	970	970	976	976	981	981	987	987	993	998	
50,000		$	383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	389	400	417	434	451	468	479	496	513	530	558	592	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	445	457	473	490	507	524	536	552	569	586	615	648	
	.07	$	502	513	530	547	564	581	592	609	626	643	671	705	
	.08	$	558	569	586	603	620	637	648	665	682	699	727	761	
	.09	$	615	626	643	660	677	694	705	722	739	756	784	818	
	.10	$	671	682	699	716	733	750	761	778	795	812	840	874	
	.12	$	778	789	806	823	840	857	868	885	902	919	947	981	
	.14	$	891	902	919	936	953	970	981	998	1015	1032	1060	1094	BALANCE POINT 22 DEG.F.
	.16	$	1004	1015	1032	1049	1066	1083	1094	1111	1128	1145	1173	1207	
60,000		$	462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	462	490	519	547	575	603	631	660	688	716	773	829	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	519	547	575	603	631	660	688	716	744	773	829	885	
	.07	$	569	598	626	654	682	710	739	767	795	823	880	936	
	.08	$	620	648	677	705	733	761	789	818	846	874	931	987	
	.09	$	677	705	733	761	789	818	846	874	902	931	987	1043	
	.10	$	727	756	784	812	840	868	897	925	953	981	1038	1094	
	.12	$	835	863	891	919	947	976	1004	1032	1060	1089	1145	1201	
	.14	$	942	970	998	1026	1055	1083	1111	1139	1168	1196	1252	1309	BALANCE POINT 29 DEG.F.
	.16	$	1049	1077	1105	1134	1162	1190	1218	1247	1275	1303	1359	1416	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	75	90	105	120	135	150	180	210	241	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL: COMPRESSOR SECTION NQS30A INDOOR A36AQ-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 30770 BTUH, 16.34 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 27770 BTUH, 3.62 COP
FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
30,000		$ 332	383	428	479	524	575	620	671	716	767	812	863	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 248	248	248	248	248	248	253	253	253	253	253	253	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 293	293	293	293	293	293	299	299	299	299	299	299	
	.07	$ 344	344	344	344	344	344	349	349	349	349	349	349	
	.08	$ 389	389	389	389	389	389	394	394	394	394	394	394	
	.09	$ 440	440	440	440	440	440	445	445	445	445	445	445	
	.10	$ 485	485	485	485	485	485	490	490	490	490	490	490	
	.12	$ 581	581	581	581	581	581	586	586	586	586	586	586	
	.14	$ 677	677	677	677	677	677	682	682	682	682	682	682	BALANCE POINT 7- DEG.F.
	.16	$ 778	778	778	778	778	778	784	784	784	784	784	784	
35,000		$ 389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 282	282	282	282	287	287	287	287	293	293	293	293	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 338	338	338	338	344	344	344	344	349	349	349	349	
	.07	$ 394	394	394	394	400	400	400	400	406	406	406	406	
	.08	$ 445	445	445	445	451	451	451	451	457	457	457	457	
	.09	$ 502	502	502	502	507	507	507	507	513	513	513	513	
	.10	$ 558	558	558	558	564	564	564	564	569	569	569	569	
	.12	$ 665	665	665	665	671	671	671	671	677	677	677	677	BALANCE POINT 3 DEG.F.
	.14	$ 773	773	773	773	778	778	778	778	784	784	784	784	
	.16	$ 880	880	880	880	885	885	885	885	891	891	891	891	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 321	327	332	332	338	344	344	349	355	355	361	361	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 378	383	389	389	394	400	400	406	411	411	417	417	
	.07	$ 440	445	451	451	457	462	462	468	473	473	479	479	
	.08	$ 496	502	507	507	513	519	519	524	530	530	536	536	
	.09	$ 558	564	569	569	575	581	581	586	592	592	598	598	
	.10	$ 615	620	626	626	631	637	637	643	648	648	654	654	
	.12	$ 733	739	744	744	750	756	756	761	767	767	773	773	
	.14	$ 852	857	863	863	868	874	874	880	885	885	891	891	BALANCE POINT 11 DEG.F.
	.16	$ 970	976	981	981	987	993	993	998	1004	1004	1010	1010	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 434	457	479	502	524	547	575	598	620	643	665	688	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 490	513	536	558	581	603	631	654	677	699	722	744	
	.07	$ 547	569	592	615	637	660	688	710	733	756	778	801	
	.08	$ 603	626	649	671	694	716	744	767	789	813	835	857	
	.09	$ 660	682	705	727	750	773	801	823	846	868	891	914	
	.10	$ 716	739	761	784	806	829	857	880	902	925	947	970	
	.12	$ 823	846	868	891	914	936	964	987	1010	1032	1055	1077	
	.14	$ 936	959	981	1004	1026	1049	1077	1100	1122	1145	1168	1190	BALANCE POINT 22 DEG.F.
	.16	$ 1049	1072	1094	1117	1139	1162	1190	1213	1235	1258	1280	1303	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 547	592	631	671	710	750	795	835	874	914	953	998	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 603	648	688	727	767	806	852	891	931	970	1010	1055	
	.07	$ 659	699	739	778	818	857	902	942	981	1021	1060	1105	
	.08	$ 705	750	789	829	868	908	953	993	1032	1072	1111	1156	
	.09	$ 761	806	846	885	925	964	1010	1049	1089	1128	1168	1213	
	.10	$ 812	857	897	936	976	1015	1060	1100	1139	1179	1218	1263	
	.12	$ 919	964	1004	1043	1083	1122	1168	1207	1247	1286	1326	1371	
	.14	$ 1026	1072	1111	1151	1190	1230	1275	1314	1354	1393	1433	1478	BALANCE POINT 29 DEG.F.
	.16	$ 1134	1179	1218	1258	1297	1337	1382	1421	1461	1500	1540	1585	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	75	90	105	120	135	150	180	210	241	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL:COMPRESSOR SECTION W0S30A INDOOR A36AQ-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 30770 BTUH,16.34 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 27110 BTUH, 3.62 COP
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	HEAT. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
30,000		$ 434	473	507	547	581	620	654	694	727	801	874	874	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 248	248	248	248	248	253	253	253	253	253	253	253	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 293	293	293	293	293	299	299	299	299	299	299	299	
	.07	$ 344	344	344	344	344	349	349	349	349	349	349	349	
	.08	$ 389	389	389	389	389	394	394	394	394	394	394	394	
	.09	$ 440	440	440	440	440	445	445	445	445	445	445	445	
	.10	$ 485	485	485	485	485	490	490	490	490	490	490	490	
	.12	$ 581	581	581	581	581	586	586	586	586	586	586	586	
	.14	$ 677	677	677	677	677	682	682	682	682	682	682	682	BALANCE POINT 7- DEG.F.
	.16	$ 778	778	778	778	778	784	784	784	784	784	784	784	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 282	282	287	287	287	287	287	293	293	293	293	293	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 338	338	344	344	344	344	344	349	349	349	349	349	
	.07	$ 394	394	400	400	400	400	400	406	406	406	406	406	
	.08	$ 445	445	451	451	451	451	451	457	457	457	457	457	
	.09	$ 502	502	507	507	507	507	507	513	513	513	513	513	
	.10	$ 558	558	564	564	564	564	564	569	569	569	569	569	
	.12	$ 665	665	671	671	671	671	671	677	677	677	677	677	
	.14	$ 773	773	778	778	778	778	778	784	784	784	784	784	BALANCE POINT 3 DEG.F.
	.16	$ 880	880	885	885	885	885	885	891	891	891	891	891	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 332	332	338	338	344	344	349	349	355	361	366	366	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 389	389	394	394	400	400	406	406	411	417	423	423	
	.07	$ 451	451	457	457	462	462	468	468	473	479	485	485	
	.08	$ 507	507	513	513	519	519	524	524	530	536	541	541	
	.09	$ 569	569	575	575	581	581	586	586	592	598	603	603	
	.10	$ 626	626	631	631	637	637	643	643	648	654	660	660	
	.12	$ 744	744	750	750	756	756	761	761	767	773	778	778	
	.14	$ 863	863	868	868	874	874	880	880	885	891	897	897	BALANCE POINT 11 DEG.F.
	.16	$ 981	981	987	987	993	993	998	998	1004	1010	1015	1015	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 486	502	519	536	552	569	586	609	626	660	694	694	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 541	558	575	592	609	626	643	665	682	716	750	750	
	.07	$ 598	615	631	648	665	682	699	722	739	773	806	806	
	.08	$ 654	671	688	705	722	739	756	778	795	829	863	863	
	.09	$ 710	727	744	761	778	795	812	835	852	885	919	919	
	.10	$ 767	784	801	818	835	852	868	891	908	942	976	976	
	.12	$ 874	891	908	925	942	959	976	998	1015	1049	1083	1083	
	.14	$ 987	1004	1021	1038	1055	1072	1089	1111	1128	1162	1196	1196	BALANCE POINT 22 DEG.F.
	.16	$ 1100	1117	1134	1151	1168	1184	1201	1224	1241	1275	1309	1309	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 637	665	699	727	761	789	823	852	885	947	1010	1010	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 694	722	756	784	818	846	880	908	942	1004	1066	1066	
	.07	$ 744	773	806	835	868	897	931	959	993	1055	1117	1117	
	.08	$ 795	823	857	885	919	947	981	1010	1043	1105	1168	1168	
	.09	$ 852	880	914	942	976	1004	1038	1066	1100	1162	1224	1224	
	.10	$ 902	931	964	993	1026	1055	1089	1117	1151	1213	1275	1275	
	.12	$ 1010	1038	1072	1100	1134	1162	1196	1224	1258	1320	1382	1382	
	.14	$ 1117	1145	1179	1207	1241	1269	1303	1331	1365	1427	1489	1489	BALANCE POINT 29 DEG.F.
	.16	$ 1224	1252	1286	1314	1348	1376	1410	1438	1472	1534	1596	1596	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	75	90	105	120	135	150	180	210	241	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL/COMPRESSOR SECTION W0S36A INDOOR A36AD-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 36680 BTUH, 15.74 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 35260 BTUH, 3.69 COP
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
35,000	.05	$ 287	885	
	.06	344	1060	
	.07	406	1241	
	.08	462	1416	
	.09	519	1596	
	.10	581	1771	
	.12	699	2127	
	.14	806	2482	BALANCE POINT 13- DEG.F.
	.16	$ 925	2838	
40,000	.05	$ 327	1010	
	.06	394	1213	
	.07	457	1416	
	.08	526	1619	
	.09	586	1824	
	.10	648	2025	
	.12	778	2431	
	.14	914	2838	BALANCE POINT 4- DEG.F.
	.16	$ 1043	3244	
50,000	.05	$ 400	1263	
	.06	473	1517	
	.07	558	1771	
	.08	637	2025	
	.09	722	2279	
	.10	795	2533	
	.12	959	3041	
	.14	$ 1117	3549	BALANCE POINT 10 DEG.F.
	.16	$ 1280	4057	
60,000	.05	$ 485	1517	
	.06	581	1822	
	.07	682	2137	
	.08	778	2434	
	.09	880	2736	
	.10	976	3041	
	.12	$ 1168	3650	
	.14	$ 1365	4260	BALANCE POINT 19 DEG.F.
	.16	$ 1557	4869	
70,000	.05	$ 588	1771	
	.06	710	2127	
	.07	840	2482	
	.08	959	2838	
	.09	1077	3193	
	.10	1196	3549	
	.12	$ 1433	4260	
	.14	$ 1675	4971	BALANCE POINT 25 DEG.F.
	.16	$ 1912	5682	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	93	111	130	149	167	186	223	261	298	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL: COMPRESSOR SECTION HQS36A INDOOR A36AQ-A
COOLING CAPACITY AT 53 DEG.F. ENTERING WATER TEMP.: 36680 BTUH, 15.74 SEER
HEATING CAPACITY AT 53 DEG.F. ENTERING WATER TEMP.: 35260 BTUH, 3.69 COP
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
35,000		$ 270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 282	282	282	282	282	282	282	282	282	282	287	287	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 338	338	338	338	338	338	338	338	338	338	344	344	
	.07	$ 394	394	394	394	394	394	394	394	394	394	400	400	
	.08	$ 451	451	451	451	451	451	451	451	451	451	457	457	
	.09	$ 507	507	507	507	507	507	507	507	507	507	513	513	
	.10	$ 564	564	564	564	564	564	564	564	564	564	569	569	
	.12	$ 677	677	677	677	677	677	677	677	677	677	682	682	
	.14	$ 784	784	784	784	784	784	784	784	784	784	789	789	BALANCE POINT 13- DEG.F.
	.16	$ 897	897	897	897	897	897	897	897	897	897	902	902	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 315	315	315	315	315	315	315	321	321	321	321	321	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 383	383	383	383	383	383	383	389	389	389	389	389	
	.07	$ 445	445	445	445	445	445	445	451	451	451	451	451	
	.08	$ 507	507	507	507	507	507	507	513	513	513	513	513	
	.09	$ 569	569	569	569	569	569	569	575	575	575	575	575	
	.10	$ 631	631	631	631	631	631	631	637	637	637	637	637	
	.12	$ 756	756	756	756	756	756	756	761	761	761	761	761	
	.14	$ 880	880	880	880	880	880	880	885	885	885	885	885	BALANCE POINT 4- DEG.F.
	.16	$ 1010	1010	1010	1010	1010	1010	1010	1015	1015	1015	1015	1015	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 389	389	394	400	400	406	406	411	411	417	423	428	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 462	462	468	473	473	479	479	485	485	490	496	502	
	.07	$ 530	530	536	541	541	547	547	552	552	558	564	569	
	.08	$ 603	603	609	615	615	620	620	626	626	631	637	643	
	.09	$ 677	677	682	688	688	694	694	699	699	705	710	716	
	.10	$ 750	750	756	761	761	767	767	773	773	778	784	789	
	.12	$ 897	897	902	908	908	914	914	919	919	925	931	936	
	.14	$ 1043	1043	1049	1055	1055	1060	1060	1066	1066	1072	1077	1083	BALANCE POINT 10 DEG.F.
	.16	$ 1190	1190	1196	1201	1201	1207	1207	1213	1213	1218	1224	1230	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 457	473	485	496	507	519	536	547	558	569	598	620	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 530	547	558	569	581	592	609	620	631	643	671	694	
	.07	$ 603	620	631	643	654	665	682	694	705	716	744	767	
	.08	$ 682	699	710	722	733	744	761	773	784	795	823	846	
	.09	$ 756	773	784	795	806	818	835	846	857	868	897	919	
	.10	$ 829	846	857	868	880	891	908	919	931	942	970	993	
	.12	$ 976	993	1004	1015	1026	1038	1055	1066	1077	1089	1117	1139	
	.14	$ 1128	1145	1156	1168	1179	1190	1207	1218	1230	1241	1269	1292	BALANCE POINT 19 DEG.F.
	.16	$ 1275	1292	1303	1314	1326	1337	1354	1365	1376	1388	1416	1438	
70,000		$ 541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 530	562	575	598	620	643	665	688	710	733	778	818	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 603	626	648	671	694	716	739	761	784	806	852	891	
	.07	$ 677	699	722	744	767	789	812	835	857	880	925	964	
	.08	$ 756	778	801	823	846	868	891	914	936	959	1004	1043	
	.09	$ 829	852	874	897	919	942	964	987	1010	1032	1077	1117	
	.10	$ 902	925	947	970	993	1015	1038	1060	1083	1105	1151	1190	
	.12	$ 1055	1077	1100	1122	1145	1168	1190	1213	1235	1258	1303	1342	
	.14	$ 1207	1230	1252	1275	1297	1320	1342	1365	1388	1410	1455	1495	BALANCE POINT 25 DEG.F.
	.16	$ 1354	1376	1399	1421	1444	1467	1489	1512	1534	1557	1602	1642	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	93	111	130	149	167	186	223	261	298	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 6
HEAT PUMP MODEL:COMPRESSOR SECTION W0S36A INDOOR A36AQ-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 36680 BTUH, 15.74 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 35260 BTUH, 3.69 COP
FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
35,000		$ 389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 282	282	282	282	282	282	287	287	287	287	287	287	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 338	338	338	338	338	338	344	344	344	344	344	344	
	.07	$ 394	394	394	394	394	394	400	400	400	400	400	400	
	.08	$ 451	451	451	451	451	451	457	457	457	457	457	457	
	.09	$ 507	507	507	507	507	507	513	513	513	513	513	513	
	.10	$ 564	564	564	564	564	564	569	569	569	569	569	569	
	.12	$ 677	677	677	677	677	677	682	682	682	682	682	682	BALANCE POINT 13- DEG.F.
	.14	$ 784	784	784	784	784	784	789	789	789	789	789	789	
	.16	$ 897	897	897	897	897	897	902	902	902	902	902	902	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 315	315	315	321	321	321	321	321	321	327	327	327	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 383	383	383	389	389	389	389	389	389	394	394	394	
	.07	$ 445	445	445	451	451	451	451	451	451	457	457	457	
	.08	$ 507	507	507	513	513	513	513	513	513	519	519	519	
	.09	$ 569	569	569	575	575	575	575	575	575	581	581	581	
	.10	$ 631	631	631	637	637	637	637	637	637	643	643	643	
	.12	$ 756	756	756	761	761	761	761	761	761	767	767	767	
	.14	$ 880	880	880	885	885	885	885	885	885	891	891	891	BALANCE POINT 4- DEG.F.
	.16	$ 1010	1010	1010	1015	1015	1015	1015	1015	1015	1021	1021	1021	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 400	400	406	411	417	423	423	428	434	440	445	445	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 473	473	479	485	490	496	496	502	507	513	519	519	
	.07	$ 541	541	547	553	558	564	564	569	575	581	586	586	
	.08	$ 615	615	620	626	631	637	637	643	648	654	660	660	
	.09	$ 688	688	694	699	705	710	710	716	722	727	733	739	
	.10	$ 761	761	767	773	778	784	784	789	795	801	806	806	
	.12	$ 908	908	914	919	925	931	931	936	942	947	953	953	
	.14	$ 1055	1055	1060	1066	1072	1077	1077	1083	1089	1094	1100	1100	BALANCE POINT 10 DEG.F.
	.16	$ 1201	1201	1207	1213	1218	1224	1224	1230	1235	1241	1247	1247	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 496	513	530	562	569	586	603	620	637	660	677	694	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 569	586	603	626	643	660	677	694	710	733	750	767	
	.07	$ 643	660	677	699	716	733	750	767	784	806	823	840	
	.08	$ 722	739	756	778	795	812	829	846	863	885	902	919	
	.09	$ 795	812	829	852	868	885	902	919	936	959	976	993	
	.10	$ 868	885	902	925	942	959	976	993	1010	1032	1049	1066	
	.12	$ 1015	1032	1049	1072	1089	1105	1122	1139	1156	1179	1196	1213	
	.14	$ 1168	1184	1201	1224	1241	1258	1275	1292	1309	1331	1348	1365	BALANCE POINT 19 DEG.F.
	.16	$ 1314	1331	1348	1371	1388	1405	1421	1438	1455	1478	1495	1512	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 603	631	665	699	727	761	795	823	857	891	919	953	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 677	705	739	773	801	835	868	897	931	964	993	1026	
	.07	$ 750	778	812	846	874	908	942	970	1004	1038	1066	1100	
	.08	$ 829	857	891	925	953	987	1021	1049	1083	1117	1145	1179	
	.09	$ 902	931	964	998	1026	1060	1094	1122	1156	1190	1218	1252	
	.10	$ 976	1004	1038	1072	1100	1134	1168	1196	1230	1263	1292	1326	
	.12	$ 1128	1156	1190	1224	1252	1286	1320	1348	1382	1416	1444	1478	
	.14	$ 1280	1309	1342	1376	1405	1438	1472	1500	1534	1568	1596	1630	BALANCE POINT 25 DEG.F.
	.16	$ 1427	1455	1489	1523	1551	1585	1619	1647	1681	1715	1743	1777	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	93	111	130	149	167	186	223	261	298	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL/COMPRESSOR SECTION W0S36A INDOOR A36AQ-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 36680 BTUH, 15.74 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 35260 BTUH, 3.69 COP
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 282	282	282	282	282	287	287	287	287	287	287	287	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 338	338	338	338	338	344	344	344	344	344	344	344	
	.07	$ 394	394	394	394	394	400	400	400	400	400	400	400	
	.08	$ 451	451	451	451	451	457	457	457	457	457	457	457	
	.09	$ 507	507	507	507	507	513	513	513	513	513	513	513	
	.10	$ 564	564	564	564	564	569	569	569	569	569	569	569	
	.12	$ 677	677	677	677	677	682	682	682	682	682	682	682	
	.14	$ 784	784	784	784	784	789	789	789	789	789	789	789	BALANCE POINT 13- DEG.F.
	.16	$ 897	897	897	897	897	902	902	902	902	902	902	902	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 315	321	321	321	321	321	321	321	321	327	327	327	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 383	389	389	389	389	389	389	389	389	394	394	394	
	.07	$ 445	451	451	451	451	451	451	451	451	457	457	457	
	.08	$ 507	513	513	513	513	513	513	513	513	519	519	519	
	.09	$ 569	575	575	575	575	575	575	575	575	581	581	581	
	.10	$ 631	637	637	637	637	637	637	637	637	643	643	643	
	.12	$ 756	761	761	761	761	761	761	761	761	767	767	767	
	.14	$ 880	885	885	885	885	885	885	885	885	891	891	891	BALANCE POINT 4- DEG.F.
	.16	$ 1010	1015	1015	1015	1015	1015	1015	1015	1015	1021	1021	1021	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 406	411	411	417	423	423	428	434	434	440	451	451	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 479	485	485	490	496	496	502	507	507	513	524	524	
	.07	$ 547	552	552	558	564	564	569	575	575	581	592	592	
	.08	$ 620	626	626	631	637	637	643	648	648	654	665	665	
	.09	$ 694	699	699	705	710	710	716	722	722	727	739	739	
	.10	$ 767	773	773	778	784	784	789	795	795	801	812	812	
	.12	$ 914	919	919	925	931	931	936	942	942	947	959	959	
	.14	$ 1060	1066	1066	1072	1077	1077	1083	1089	1089	1094	1105	1105	BALANCE POINT 10 DEG.F.
	.16	$ 1207	1213	1213	1218	1224	1224	1230	1235	1235	1241	1252	1252	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 536	547	564	575	592	603	615	631	643	671	699	699	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 609	620	637	648	665	677	688	705	716	744	773	773	
	.07	$ 682	694	710	722	739	750	761	778	789	818	846	846	
	.08	$ 761	773	789	801	818	829	840	857	868	897	925	925	
	.09	$ 835	846	863	874	891	902	914	931	942	970	998	998	
	.10	$ 908	919	936	947	964	976	987	1004	1015	1043	1072	1072	
	.12	$ 1056	1066	1083	1094	1111	1122	1134	1151	1162	1190	1218	1218	
	.14	$ 1207	1218	1235	1247	1263	1275	1286	1303	1314	1342	1371	1371	BALANCE POINT 19 DEG.F.
	.16	$ 1354	1365	1382	1393	1410	1421	1433	1450	1461	1489	1517	1517	
70,000		$ 1021	1106	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 671	694	716	744	767	789	818	840	863	914	959	959	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 744	767	789	818	840	863	891	914	936	987	1032	1032	
	.07	$ 818	840	863	891	914	936	964	987	1010	1060	1105	1105	
	.08	$ 897	919	942	970	993	1015	1043	1066	1089	1139	1184	1184	
	.09	$ 970	993	1015	1043	1066	1089	1117	1139	1162	1213	1258	1258	
	.10	$ 1043	1066	1089	1117	1139	1162	1190	1213	1235	1286	1331	1331	
	.12	$ 1196	1218	1241	1269	1292	1314	1342	1365	1388	1438	1484	1484	
	.14	$ 1348	1371	1393	1421	1444	1467	1495	1517	1540	1591	1636	1636	BALANCE POINT 25 DEG.F.
	.16	$ 1495	1517	1540	1568	1591	1613	1642	1664	1687	1737	1783	1783	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	93	111	130	149	167	186	223	261	298	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL/COMPRESSOR SECTION HOS42A INDOOR A42AD-A
COOLING CAPACITY AT 95 DEG.F.ENTERING WATER TEMP.: 43320 BTUH, 15.25 SEER
HEATING CAPACITY AT 50 DEG.F.ENTERING WATER TEMP.: 41500 BTUH, 3.59 COP
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
40,000				
	.05	$ 338	1010	
	.06	$ 411	1213	
	.07	$ 479	1416	
	.08	$ 547	1619	
	.09	$ 615	1822	
	.10	$ 682	2025	
	.12	$ 818	2431	
	.14	$ 953	2838	BALANCE POINT 16- DEG.F.
	.16	$ 1089	3244	
50,000				
	.05	$ 417	1263	
	.06	$ 496	1517	
	.07	$ 581	1771	
	.08	$ 665	2025	
	.09	$ 744	2279	
	.10	$ 835	2533	
	.12	$ 998	3041	
	.14	$ 1162	3549	BALANCE POINT 0 DEG.F.
	.16	$ 1331	4057	
60,000				
	.05	$ 490	1517	
	.06	$ 586	1822	
	.07	$ 682	2127	
	.08	$ 784	2431	
	.09	$ 880	2736	
	.10	$ 981	3041	
	.12	$ 1179	3650	
	.14	$ 1376	4260	BALANCE POINT 11 DEG.F.
	.16	$ 1574	4869	
70,000				
	.05	$ 581	1771	
	.06	$ 699	2127	
	.07	$ 810	2482	
	.08	$ 931	2838	
	.09	$ 1049	3193	
	.10	$ 1162	3549	
	.12	$ 1393	4260	
	.14	$ 1625	4971	BALANCE POINT 19 DEG.F.
	.16	$ 1856	5682	
80,000				
	.05	$ 688	2025	
	.06	$ 829	2431	
	.07	$ 970	2838	
	.08	$ 1105	3244	
	.09	$ 1241	3650	
	.10	$ 1382	4057	
	.12	$ 1650	4869	
	.14	$ 1936	5682	BALANCE POINT 24 DEG.F.
	.16	$ 2206	6494	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$ 106	127	149	170	191	213	255	298	341	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL:COMPRESSOR SECTION MOS42A INDOOR A42AD-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 43320 BTUH, 16.25 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 41500 BTUH, 3.59 COP
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 332	332	332	332	332	332	332	332	332	338	338	338	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 400	400	400	400	400	400	400	400	400	406	406	406	
	.07	$ 468	468	468	468	468	468	468	468	468	473	473	473	
	.08	$ 530	530	530	530	530	530	530	530	530	536	536	536	
	.09	$ 598	598	598	598	598	598	598	598	598	603	603	603	
	.10	$ 665	665	665	665	665	665	665	665	665	671	671	671	
	.12	$ 795	795	795	795	795	795	795	795	795	801	801	801	
	.14	$ 925	925	925	925	925	925	925	925	925	931	931	931	BALANCE POINT 16- DEG.F.
	.16	$ 1055	1055	1055	1055	1055	1055	1055	1055	1055	1060	1060	1060	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 406	406	406	411	411	411	411	411	411	417	417	417	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 485	485	485	490	490	490	490	490	490	496	496	496	
	.07	$ 564	564	564	569	569	569	569	569	569	575	575	575	
	.08	$ 643	643	643	648	648	648	648	648	648	654	654	654	
	.09	$ 722	722	722	727	727	727	727	727	727	733	733	733	
	.10	$ 801	801	801	806	806	806	806	806	806	813	812	812	
	.12	$ 959	959	959	964	964	964	964	964	964	970	970	970	
	.14	$ 1117	1117	1117	1122	1122	1122	1122	1122	1122	1128	1128	1128	BALANCE POINT 9 DEG.F.
	.16	$ 1280	1280	1280	1286	1286	1286	1286	1286	1286	1292	1292	1292	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 473	473	479	485	485	490	496	496	502	507	513	519	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 564	564	569	575	575	581	586	586	593	598	603	609	
	.07	$ 654	654	660	665	665	671	677	677	682	688	694	699	
	.08	$ 744	744	750	756	756	761	767	767	773	778	784	789	
	.09	$ 835	835	840	846	846	852	857	857	863	868	874	880	
	.10	$ 925	925	931	936	936	942	947	947	953	959	964	970	
	.12	$ 1105	1106	1111	1117	1117	1123	1128	1128	1134	1139	1145	1151	
	.14	$ 1286	1286	1292	1297	1297	1303	1309	1309	1314	1320	1326	1331	BALANCE POINT 11 DEG.F.
	.16	$ 1461	1461	1467	1472	1472	1478	1484	1484	1489	1495	1500	1506	
70,000		$ 541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 547	558	575	593	603	620	631	648	660	677	705	733	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 637	648	665	682	694	710	722	739	750	767	795	823	
	.07	$ 727	739	756	773	784	801	813	829	840	857	885	914	
	.08	$ 818	829	846	863	874	891	902	919	931	947	976	1004	
	.09	$ 908	919	936	953	964	981	993	1010	1021	1038	1066	1094	
	.10	$ 993	1004	1021	1038	1049	1066	1077	1094	1105	1122	1151	1179	
	.12	$ 1173	1184	1201	1218	1230	1247	1258	1275	1286	1303	1331	1359	
	.14	$ 1354	1366	1382	1399	1410	1427	1438	1455	1467	1484	1512	1540	BALANCE POINT 19 DEG.F.
	.16	$ 1529	1540	1557	1574	1585	1602	1613	1630	1642	1658	1687	1715	
80,000		$ 620	705	795	885	976	1060	1151	1241	1331	1416	1596	1771	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 620	648	671	699	722	750	773	801	823	852	902	953	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 705	733	756	784	806	835	857	885	908	936	987	1038	
	.07	$ 796	823	846	874	897	925	947	976	998	1026	1077	1128	
	.08	$ 885	914	936	964	981	1015	1038	1066	1089	1117	1168	1218	
	.09	$ 976	1004	1026	1055	1077	1105	1128	1156	1179	1207	1258	1309	
	.10	$ 1060	1089	1111	1139	1162	1190	1213	1241	1263	1292	1342	1393	
	.12	$ 1241	1269	1292	1320	1342	1371	1393	1421	1444	1472	1523	1574	
	.14	$ 1416	1444	1467	1495	1517	1546	1568	1596	1619	1647	1698	1749	BALANCE POINT 24 DEG.F.
	.16	$ 1596	1625	1647	1675	1698	1726	1749	1777	1799	1828	1878	1929	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	106	127	149	170	191	213	255	298	341	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL COMPRESSOR SECTION MOS42A INDOOR A42AQ-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 43320 BTUH, 16.25 SEER
HEATING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 41500 BTUH, 3.59 COP
FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 332	332	332	332	338	338	338	338	338	338	338	344	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 400	400	400	400	406	406	406	406	406	406	406	411	
	.07	$ 468	468	468	468	473	473	473	473	473	473	473	479	
	.08	$ 530	530	530	530	536	536	536	536	536	536	536	541	
	.09	$ 598	598	598	598	603	603	603	603	603	603	603	609	
	.10	$ 665	665	665	665	671	671	671	671	671	671	671	677	
	.12	$ 795	795	795	795	801	801	801	801	801	801	801	806	BALANCE POINT 16- DEG.F.
	.14	$ 925	925	925	925	931	931	931	931	931	931	931	936	
	.16	$ 1055	1055	1055	1055	1060	1060	1060	1060	1060	1060	1060	1066	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 411	411	411	411	417	417	417	417	423	423	423	423	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 490	490	490	490	496	496	496	496	502	502	502	502	
	.07	$ 569	569	569	569	575	575	575	575	581	581	581	581	
	.08	$ 648	648	648	648	654	654	654	654	660	660	660	660	
	.09	$ 727	727	727	727	733	733	733	733	739	739	739	739	
	.10	$ 806	806	806	806	812	812	812	812	818	818	818	818	
	.12	$ 964	964	964	964	970	970	970	970	976	976	976	976	BALANCE POINT 0 DEG.F.
	.14	$ 1122	1122	1122	1122	1128	1128	1128	1128	1134	1134	1134	1134	
	.16	$ 1286	1286	1286	1286	1292	1292	1292	1292	1297	1297	1297	1297	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 485	490	496	502	502	507	513	519	524	530	536	541	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 575	581	586	592	592	598	603	609	615	620	626	631	
	.07	$ 665	671	677	682	682	688	694	699	705	710	716	722	
	.08	$ 756	761	767	773	773	778	784	789	795	801	806	812	
	.09	$ 846	852	857	863	863	868	874	880	885	891	897	902	
	.10	$ 936	942	947	953	953	959	964	970	976	981	987	993	
	.12	$ 1117	1122	1128	1134	1134	1139	1145	1151	1156	1162	1168	1173	BALANCE POINT 11 DEG.F.
	.14	$ 1297	1303	1309	1314	1314	1320	1326	1331	1337	1342	1348	1354	
	.16	$ 1472	1478	1484	1489	1489	1495	1500	1506	1512	1517	1523	1529	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 592	615	631	654	677	694	716	739	756	778	801	818	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 682	705	722	741	767	784	806	829	846	868	891	908	
	.07	$ 773	795	812	835	857	874	897	919	936	959	981	998	
	.08	$ 863	885	902	925	941	964	987	1010	1026	1049	1072	1089	
	.09	$ 953	976	993	1015	1038	1055	1077	1100	1117	1139	1162	1179	
	.10	$ 1038	1060	1077	1100	1122	1139	1162	1184	1201	1224	1247	1263	
	.12	$ 1218	1241	1258	1280	1303	1320	1342	1365	1382	1405	1427	1444	BALANCE POINT 19 DEG.F.
	.14	$ 1399	1421	1438	1461	1484	1500	1523	1546	1563	1585	1608	1625	
	.16	$ 1574	1596	1613	1636	1658	1675	1698	1721	1737	1760	1783	1799	
80,000		$ 891	1021	1151	1280	1405	1534	1664	1788	1918	2048	2172	2302	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 699	739	773	812	846	885	919	959	993	1026	1066	1100	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 784	823	857	897	931	970	1004	1043	1077	1111	1151	1184	
	.07	$ 873	914	947	987	1021	1060	1094	1134	1168	1201	1241	1275	
	.08	$ 964	1004	1038	1077	1111	1151	1184	1224	1258	1292	1331	1365	
	.09	$ 1055	1094	1128	1168	1201	1241	1275	1314	1348	1382	1421	1455	
	.10	$ 1139	1179	1213	1252	1286	1326	1359	1399	1433	1467	1506	1540	
	.12	$ 1320	1359	1393	1433	1467	1506	1540	1579	1613	1647	1687	1721	BALANCE POINT 24 DEG.F.
	.14	$ 1496	1534	1568	1608	1642	1681	1715	1754	1788	1822	1862	1895	
	.16	$ 1675	1715	1749	1788	1822	1862	1895	1935	1969	2000	2042	2076	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	106	127	149	170	191	213	255	298	341	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

VERSION 4
HEAT PUMP MODEL/COMPRESSOR SECTION MOS42A INDOOR A42AQ-A
COOLING CAPACITY AT 53 DEG.F.ENTERING WATER TEMP.: 43320 BTUH,16.25 SEER
HEATING CAPACITY AT 51 DEG.F.ENTERING WATER TEMP.: 41500 BTUH, 3.59 COP
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 332	332	332	338	338	338	338	338	338	338	344	344	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 400	400	400	406	406	406	406	406	406	406	411	411	
	.07	$ 468	468	468	473	473	473	473	473	473	473	479	479	
	.08	$ 530	530	530	536	536	536	536	536	536	536	541	541	
	.09	$ 598	598	598	603	603	603	603	603	603	603	609	609	
	.10	$ 665	665	665	671	671	671	671	671	671	671	677	677	
	.12	$ 795	795	795	801	801	801	801	801	801	801	806	806	BALANCE POINT 16- DEG.F.
	.14	$ 925	925	925	931	931	931	931	931	931	931	936	936	
	.16	$ 1055	1055	1055	1060	1060	1060	1060	1060	1060	1060	1066	1066	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 411	411	417	417	417	417	417	417	423	423	423	423	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 490	490	496	496	496	496	496	496	502	502	502	502	
	.07	$ 569	569	575	575	575	575	575	575	581	581	581	581	
	.08	$ 648	648	654	654	654	654	654	654	660	660	660	660	
	.09	$ 727	727	733	733	733	733	733	733	739	739	739	739	
	.10	$ 806	806	812	812	812	812	812	812	818	818	818	818	
	.12	$ 964	964	970	970	970	970	970	970	976	976	976	976	BALANCE POINT 0 DEG.F.
	.14	$ 1122	1122	1128	1128	1128	1128	1128	1128	1134	1134	1134	1134	
	.16	$ 1286	1286	1292	1292	1292	1292	1292	1292	1297	1297	1297	1297	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 496	496	502	507	513	513	519	524	530	536	541	541	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 586	586	592	598	603	603	609	615	620	626	631	631	
	.07	$ 677	677	682	688	694	694	699	705	710	716	722	722	
	.08	$ 767	767	773	778	784	784	789	795	801	806	812	812	
	.09	$ 857	857	863	868	874	874	880	885	891	897	902	902	
	.10	$ 947	947	953	959	964	964	970	976	981	987	993	993	
	.12	$ 1128	1128	1134	1139	1145	1145	1151	1156	1162	1168	1173	1173	BALANCE POINT 11 DEG.F.
	.14	$ 1309	1309	1314	1320	1326	1326	1331	1337	1342	1348	1354	1354	
	.16	$ 1484	1484	1489	1495	1500	1500	1506	1512	1517	1523	1529	1529	
70,000		$ 1021	1105	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 637	654	665	682	699	716	733	744	761	795	829	829	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 727	744	756	773	789	806	823	835	852	885	919	919	
	.07	$ 818	835	846	863	880	897	914	925	943	976	1010	1010	
	.08	$ 908	925	936	953	970	987	1004	1015	1032	1066	1100	1100	
	.09	$ 998	1015	1026	1043	1060	1077	1094	1105	1122	1156	1190	1190	
	.10	$ 1083	1100	1111	1128	1145	1162	1179	1190	1207	1241	1275	1275	
	.12	$ 1263	1280	1292	1309	1326	1343	1359	1371	1388	1421	1455	1455	BALANCE POINT 19 DEG.F.
	.14	$ 1444	1461	1472	1489	1506	1523	1540	1551	1568	1602	1636	1636	
	.16	$ 1619	1636	1647	1664	1681	1698	1715	1726	1743	1777	1811	1811	
80,000		$ 1168	1263	1365	1461	1557	1658	1754	1850	1952	2144	2341	2341	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 778	806	835	863	891	919	947	976	1004	1055	1111	1111	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 863	891	919	947	976	1004	1032	1060	1089	1139	1196	1196	
	.07	$ 953	981	1010	1038	1066	1094	1122	1151	1179	1230	1286	1286	
	.08	$ 1043	1072	1100	1128	1156	1184	1213	1241	1269	1320	1376	1376	
	.09	$ 1134	1162	1190	1218	1247	1275	1303	1331	1359	1410	1467	1467	
	.10	$ 1218	1247	1275	1303	1331	1359	1388	1416	1444	1496	1551	1551	
	.12	$ 1399	1427	1455	1484	1512	1540	1568	1596	1625	1675	1732	1732	BALANCE POINT 24 DEG.F.
	.14	$ 1574	1602	1630	1658	1687	1715	1743	1771	1799	1850	1907	1907	
	.16	$ 1754	1783	1811	1839	1867	1895	1924	1952	1980	2031	2087	2087	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	106	127	149	170	191	213	255	298	341	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4
HEAT PUMP MODEL: OUTDOOR 24UHPQA/A30AQ-A INDOOR A30AQ-A
ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69
ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.ORH REG IV
BTUH (17) 12500, COP(17) 1.90
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
25,000				
	.05	$ 332	631	
	.06	400	756	
	.07	473	885	
	.08	541	1010	
	.09	603	1139	
	.10	671	1263	
	.12	806	1517	
	.14	942	1771	BALANCE POINT 21 DEG.F.
	.16	1077	2025	
30,000				
	.05	$ 411	756	
	.06	490	908	
	.07	575	1060	
	.08	664	1213	
	.09	739	1365	
	.10	812	1517	
	.12	976	1822	
	.14	1139	2127	BALANCE POINT 25 DEG.F.
	.16	1303	2431	
35,000				
	.05	$ 485	885	
	.06	586	1060	
	.07	677	1241	
	.08	778	1416	
	.09	874	1596	
	.10	970	1771	
	.12	1162	2124	
	.14	1359	2482	BALANCE POINT 29 DEG.F.
	.16	1557	2838	
40,000				
	.05	$ 569	1010	
	.06	677	1213	
	.07	795	1416	
	.08	908	1619	
	.09	1021	1822	
	.10	1134	2025	
	.12	1359	2431	
	.14	1585	2838	BALANCE POINT 31 DEG.F.
	.16	1811	3244	
50,000				
	.05	$ 750	1263	
	.06	902	1517	
	.07	1055	1771	
	.08	1207	2025	
	.09	1359	2279	
	.10	1512	2533	
	.12	1811	3041	
	.14	2110	3549	BALANCE POINT 36 DEG.F.
	.16	2415	4057	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	99	118	138	158	178	198	237	277	317	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4

HEAT PUMP MODEL: OUTDOOR 24UHPQA/A30AQ-A
INDOOR A30AQ-A

ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69

ARI RATED HEATING CAP.: BTUH (47) 24000, COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV
BTUH (17) 12500, COP(17) 1.90

FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. RATE $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
25,000		$ 191	220	248	276	304	332	355	383	411	440	496	552	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 282	287	293	299	304	310	315	321	327	332	338	349	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 332	338	344	349	355	361	366	372	378	383	389	400	
	.07	$ 378	383	389	394	400	406	411	417	423	428	434	445	
	.08	$ 428	434	440	445	451	457	462	468	473	479	485	496	
	.09	$ 479	485	490	496	502	507	513	519	524	530	536	547	
	.10	$ 530	536	541	547	552	558	564	569	575	581	586	598	
	.12	$ 626	631	637	643	648	654	660	665	671	677	682	694	
	.14	$ 727	733	739	744	750	756	761	767	773	778	784	795	BALANCE POINT 21 DEG.F.
	.16	$ 823	829	835	840	846	852	857	863	868	874	880	891	
30,000		$ 231	265	299	332	361	394	428	462	496	530	598	665	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 321	327	338	349	355	366	378	389	394	406	423	445	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 372	378	389	400	406	417	428	440	445	457	473	496	
	.07	$ 423	428	440	451	457	468	479	490	496	507	524	547	
	.08	$ 473	479	490	502	507	519	530	541	547	558	575	598	
	.09	$ 524	530	541	552	558	569	581	592	598	609	626	648	
	.10	$ 575	581	592	603	609	620	631	643	648	660	677	699	
	.12	$ 671	677	688	699	705	716	727	739	744	756	773	795	
	.14	$ 773	778	789	801	806	818	829	840	846	857	874	897	BALANCE POINT 25 DEG.F.
	.16	$ 874	880	891	902	908	919	931	942	947	959	976	998	
35,000		$ 270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 344	361	378	394	411	428	445	462	479	496	524	558	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 389	406	423	440	457	473	490	507	524	541	569	603	
	.07	$ 434	451	468	485	502	519	536	552	569	586	615	648	
	.08	$ 479	496	513	530	547	564	581	598	615	631	660	694	
	.09	$ 530	547	564	581	598	615	631	648	665	682	710	744	
	.10	$ 575	592	609	626	643	660	677	694	710	727	756	789	
	.12	$ 665	682	699	716	733	750	767	784	801	818	846	880	
	.14	$ 761	778	795	812	829	846	863	880	897	914	942	976	BALANCE POINT 29 DEG.F.
	.16	$ 852	868	885	902	919	936	953	970	987	1004	1032	1066	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 389	411	428	445	468	485	502	524	541	558	598	637	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 440	462	479	496	519	536	552	575	592	609	648	688	
	.07	$ 490	513	530	547	569	586	603	626	643	660	699	739	
	.08	$ 541	564	581	598	620	637	654	677	694	710	750	789	
	.09	$ 592	615	631	648	671	688	705	727	744	761	801	840	
	.10	$ 643	665	682	699	722	739	756	778	795	812	852	891	
	.12	$ 750	773	789	806	829	846	863	885	902	919	959	998	
	.14	$ 852	874	891	908	931	947	964	987	1004	1021	1060	1100	BALANCE POINT 31 DEG.F.
	.16	$ 953	976	993	1010	1032	1049	1066	1089	1105	1122	1162	1201	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 445	479	513	547	581	609	643	677	710	744	812	874	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 490	524	558	592	626	654	688	722	756	789	857	919	
	.07	$ 536	569	603	637	671	699	733	767	801	835	902	964	
	.08	$ 575	609	643	677	710	739	773	806	840	874	942	1004	
	.09	$ 620	654	688	722	756	784	818	852	885	919	987	1049	
	.10	$ 660	694	727	761	795	823	857	891	925	959	1026	1089	
	.12	$ 750	784	818	852	885	914	947	981	1015	1049	1117	1179	
	.14	$ 835	868	902	936	970	998	1032	1066	1100	1134	1201	1263	BALANCE POINT 36 DEG.F.
	.16	$ 919	953	987	1021	1055	1083	1117	1151	1184	1218	1286	1348	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	99	118	138	158	178	198	237	277	317	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 24UTPQA/A30AQ-A

HEAT PUMP MODEL: OUTDOOR 24URPQA — INDOOR A30AQ-A

ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69

ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.DHR REQ IV
BTUH (17) 12500, COP(17) 1.90

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
25,000		$ 276	315	355	394	440	479	519	558	598	637	677	716	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 299	310	315	321	332	338	344	349	361	366	372	383	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 349	361	366	372	383	389	394	400	411	417	423	434	
	.07	$ 394	406	411	417	428	434	440	445	457	462	468	479	
	.08	$ 445	457	462	468	479	485	490	496	507	513	519	530	
	.09	$ 496	507	513	519	530	536	541	547	558	564	569	581	
	.10	$ 547	558	564	569	581	586	592	598	609	615	620	631	
	.12	$ 643	654	660	666	677	682	688	694	705	710	716	727	
	.14	$ 744	756	761	767	778	784	789	795	806	812	818	829	BALANCE POINT 21 DEG.F.
	.16	$ 840	852	857	863	874	880	885	891	902	908	914	925	
30,000		$ 332	383	428	479	524	575	620	671	716	767	812	863	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 349	361	378	389	406	417	434	445	457	473	485	502	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 400	411	428	440	457	468	485	496	507	524	536	552	
	.07	$ 451	462	479	490	507	519	536	547	558	575	586	603	
	.08	$ 502	513	530	541	558	569	586	598	609	626	637	654	
	.09	$ 553	564	581	592	609	620	637	648	660	677	688	705	
	.10	$ 603	615	631	643	660	671	688	699	710	727	739	756	
	.12	$ 699	710	727	739	756	767	784	795	806	823	835	852	
	.14	$ 801	812	829	840	857	868	885	897	908	925	936	953	BALANCE POINT 25 DEG.F.
	.16	$ 902	914	931	942	959	970	987	998	1010	1026	1038	1055	
35,000		$ 389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 394	423	445	468	490	513	541	564	586	609	631	660	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 440	468	490	513	536	558	586	609	631	654	677	705	
	.07	$ 485	513	536	558	581	603	631	654	677	699	722	750	
	.08	$ 530	558	581	603	626	648	677	699	722	744	767	795	
	.09	$ 581	609	631	654	677	699	727	750	773	795	818	846	
	.10	$ 626	654	677	699	722	744	773	795	818	840	863	891	
	.12	$ 716	744	767	789	812	835	863	885	908	931	953	981	
	.14	$ 812	840	863	885	908	931	959	981	1004	1026	1049	1077	BALANCE POINT 29 DEG.F.
	.16	$ 902	931	953	976	998	1021	1049	1072	1094	1117	1139	1168	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 451	473	502	530	558	586	609	637	665	694	722	744	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 502	524	552	581	609	637	660	688	716	744	773	795	
	.07	$ 552	575	603	631	660	688	710	739	767	795	823	846	
	.08	$ 603	626	654	682	710	739	761	789	818	846	874	897	
	.09	$ 654	677	705	733	761	789	812	840	868	897	925	947	
	.10	$ 705	727	756	784	812	840	863	891	919	947	976	998	
	.12	$ 812	835	863	891	919	947	970	998	1026	1055	1083	1105	
	.14	$ 914	936	964	993	1021	1049	1072	1100	1128	1156	1184	1207	BALANCE POINT 31 DEG.F.
	.16	$ 1015	1038	1066	1094	1122	1151	1173	1201	1230	1258	1286	1309	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 547	598	643	694	739	789	835	885	931	976	1026	1072	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 592	643	688	739	784	835	880	931	976	1021	1072	1117	
	.07	$ 637	688	733	784	829	880	925	976	1021	1066	1117	1162	
	.08	$ 677	727	773	823	868	919	964	1015	1060	1105	1156	1201	
	.09	$ 722	773	818	868	914	964	1010	1060	1105	1151	1201	1247	
	.10	$ 767	812	857	908	953	1004	1049	1100	1145	1190	1241	1286	
	.12	$ 852	902	947	998	1043	1094	1139	1190	1235	1288	1331	1376	
	.14	$ 936	987	1032	1083	1128	1179	1224	1275	1320	1365	1416	1461	BALANCE POINT 36 DEG.F.
	.16	$ 1021	1072	1117	1168	1213	1263	1309	1359	1405	1450	1500	1546	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	99	118	138	158	178	198	237	277	317	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 24UHPQA/A30AQ-A

HEAT PUMP MODEL: OUTDOOR 24UHPQA — INDOOR A30AQ-A

ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69

ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV

BTUH (17) 12500, COP(17) 1.90

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
25,000		$ 361	394	423	457	485	513	547	575	609	665	727	727	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 315	321	327	332	338	344	349	355	361	372	383	383	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 366	372	378	383	389	394	400	406	411	423	434	434	
	.07	$ 411	417	423	428	434	440	445	451	457	468	479	479	
	.08	$ 462	468	473	479	485	490	496	502	507	519	530	530	
	.09	$ 513	519	524	530	536	541	547	552	558	569	581	581	
	.10	$ 564	569	575	581	586	592	598	603	609	620	631	631	
	.12	$ 665	665	671	677	682	688	694	699	705	716	727	727	BALANCE POINT 21 DEG.F.
	.14	$ 761	767	773	778	784	789	795	801	806	818	829	829	
	.16	$ 857	863	868	874	880	885	891	897	902	914	925	925	
30,000		$ 434	473	507	547	581	620	654	694	727	801	874	874	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 378	389	400	411	423	428	440	451	462	485	502	502	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 428	440	451	462	473	479	490	502	513	536	552	552	
	.07	$ 479	490	502	513	524	530	541	552	564	586	603	603	
	.08	$ 530	541	552	564	575	581	592	603	615	637	654	654	
	.09	$ 581	592	603	615	626	631	643	654	665	688	705	705	
	.10	$ 631	643	654	665	677	682	694	705	716	739	756	756	
	.12	$ 727	739	750	761	773	778	789	801	812	835	852	852	BALANCE POINT 25 DEG.F.
	.14	$ 839	840	852	863	874	880	891	902	914	936	953	953	
	.16	$ 931	942	953	964	976	981	993	1004	1015	1038	1055	1055	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 445	468	485	502	519	536	558	575	593	626	665	665	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 496	513	530	547	564	581	603	620	637	671	710	710	
	.07	$ 536	558	575	592	609	626	648	665	682	716	756	756	
	.08	$ 581	603	620	637	654	671	694	710	727	761	801	801	
	.09	$ 631	654	671	688	705	722	744	761	778	812	852	852	
	.10	$ 677	699	716	733	750	767	789	806	823	857	897	897	
	.12	$ 767	789	806	823	840	857	880	897	914	947	987	987	BALANCE POINT 29 DEG.F.
	.14	$ 863	885	902	919	936	953	976	993	1010	1043	1083	1083	
	.16	$ 953	976	993	1010	1026	1043	1066	1083	1100	1134	1173	1173	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 507	530	547	569	592	609	631	654	671	710	756	756	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 558	581	598	620	643	660	682	705	722	761	806	806	
	.07	$ 609	631	648	671	694	710	733	756	773	812	857	857	
	.08	$ 660	682	699	722	744	761	784	806	823	863	908	908	
	.09	$ 710	733	750	773	795	812	835	857	874	914	959	959	
	.10	$ 761	784	801	823	846	863	885	908	925	964	1010	1010	
	.12	$ 868	891	908	931	953	970	993	1015	1032	1072	1117	1117	BALANCE POINT 31 DEG.F.
	.14	$ 970	993	1010	1032	1055	1072	1094	1117	1134	1173	1218	1218	
	.16	$ 1072	1094	1111	1134	1156	1173	1196	1218	1235	1275	1320	1320	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 648	688	722	761	795	835	868	908	942	1015	1089	1089	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 694	733	767	806	840	880	914	953	987	1060	1134	1134	
	.07	$ 739	778	812	852	885	925	959	998	1032	1105	1179	1179	
	.08	$ 778	818	852	891	925	964	998	1038	1072	1145	1218	1218	
	.09	$ 823	863	897	936	970	1010	1043	1083	1117	1190	1263	1263	
	.10	$ 863	902	936	976	1010	1049	1083	1122	1156	1230	1303	1303	
	.12	$ 953	993	1026	1066	1100	1139	1173	1213	1247	1320	1393	1393	BALANCE POINT 36 DEG.F.
	.14	$ 1038	1077	1111	1151	1184	1224	1258	1297	1331	1405	1478	1478	
	.16	$ 1122	1162	1196	1235	1269	1309	1342	1382	1416	1489	1563	1563	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	99	118	138	158	178	198	237	277	317	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19

ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DEH REG IV

BTUH (17) 16400, COP(17) 2.10

FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
30,000	.05	$ 372	756	
	.06	$ 451	908	
	.07	$ 530	1060	
	.08	$ 598	1213	
	.09	$ 677	1365	
	.10	$ 750	1517	
	.12	$ 902	1822	
	.14	$ 1049	2127	BALANCE POINT 20 DEG.F.
	.16	$ 1201	2431	
35,000	.05	$ 445	885	
	.06	$ 530	1060	
	.07	$ 620	1241	
	.08	$ 710	1416	
	.09	$ 795	1596	
	.10	$ 885	1771	
	.12	$ 1066	2127	
	.14	$ 1241	2482	BALANCE POINT 23 DEG.F.
	.16	$ 1410	2838	
40,000	.05	$ 513	1010	
	.06	$ 615	1213	
	.07	$ 716	1416	
	.08	$ 818	1619	
	.09	$ 919	1822	
	.10	$ 1026	2025	
	.12	$ 1230	2431	
	.14	$ 1438	2838	BALANCE POINT 27 DEG.F.
	.16	$ 1642	3244	
50,000	.05	$ 677	1263	
	.06	$ 806	1517	
	.07	$ 942	1771	
	.08	$ 1071	2025	
	.09	$ 1214	2279	
	.10	$ 1348	2533	
	.12	$ 1619	3041	
	.14	$ 1890	3549	BALANCE POINT 32 DEG.F.
	.16	$ 2155	4057	
60,000	.05	$ 863	1517	
	.06	$ 1032	1822	
	.07	$ 1207	2127	
	.08	$ 1376	2431	
	.09	$ 1551	2736	
	.10	$ 1721	3041	
	.12	$ 2070	3650	
	.14	$ 2409	4260	BALANCE POINT 36 DEG.F.
	.16	$ 2753	4869	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	122	147	171	196	220	245	294	343	392	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19

ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REG IV

BTUH (17) 16400, COP(17) 2.10

FURNACE TYPE NATURAL GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
30,000		$ 231	265	299	332	361	394	428	462	496	530	598	665	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 327	332	338	344	349	355	361	366	372	383	394	406	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 383	389	394	400	406	411	417	423	428	440	451	462	
	.07	$ 434	440	445	451	457	462	468	473	479	490	502	513	
	.08	$ 490	496	502	507	513	519	524	530	536	547	558	569	
	.09	$ 547	552	558	564	569	575	581	586	592	603	615	626	
	.10	$ 603	609	615	620	626	631	637	643	648	660	671	682	
	.12	$ 716	722	727	733	739	744	750	756	761	773	784	795	BALANCE POINT 20 DEG.F.
	.14	$ 829	835	840	846	852	857	863	868	874	885	897	908	
	.16	$ 942	947	953	959	964	970	976	981	987	998	1010	1021	
35,000		$ 270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 361	372	383	394	406	417	423	434	445	457	479	502	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 417	428	440	451	462	473	479	490	502	513	536	559	
	.07	$ 468	479	490	502	513	524	530	541	553	564	586	609	
	.08	$ 524	536	547	558	569	581	586	598	609	620	643	665	
	.09	$ 581	592	603	615	626	637	643	654	665	677	699	722	
	.10	$ 637	648	660	671	682	694	699	710	722	733	756	778	
	.12	$ 750	761	773	784	795	806	812	823	835	846	868	891	BALANCE POINT 23 DEG.F.
	.14	$ 863	874	885	897	908	919	925	936	947	959	981	1004	
	.16	$ 976	987	998	1010	1021	1032	1038	1049	1060	1072	1094	1117	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 383	406	423	440	462	479	496	519	536	552	592	631	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 434	457	473	490	513	530	547	569	586	603	643	682	
	.07	$ 485	507	524	541	564	581	598	620	637	654	694	733	
	.08	$ 530	552	569	586	609	626	643	665	682	699	739	778	
	.09	$ 581	603	620	637	660	677	694	716	733	750	789	829	
	.10	$ 631	654	671	688	710	727	744	767	784	801	840	880	
	.12	$ 733	756	773	789	812	829	846	868	885	903	942	981	BALANCE POINT 27 DEG.F.
	.14	$ 835	857	874	891	914	931	947	970	987	1004	1043	1083	
	.16	$ 936	959	976	993	1015	1032	1049	1072	1089	1105	1145	1184	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 440	473	507	541	575	603	637	671	705	739	806	868	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 485	519	552	586	620	648	682	716	750	784	852	914	
	.07	$ 524	558	592	626	660	688	722	756	789	823	891	953	
	.08	$ 569	603	637	671	705	733	767	801	835	868	936	998	
	.09	$ 609	643	677	710	744	773	806	840	874	908	976	1038	
	.10	$ 654	688	722	756	789	818	852	885	919	953	1021	1083	
	.12	$ 739	773	806	840	874	902	936	970	1004	1038	1105	1168	BALANCE POINT 32 DEG.F.
	.14	$ 833	857	891	925	959	987	1021	1055	1089	1122	1190	1252	
	.16	$ 908	942	976	1010	1043	1072	1105	1139	1173	1207	1275	1337	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 524	564	603	643	688	727	767	806	846	885	964	1043	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 569	609	648	688	733	773	812	852	891	931	1010	1089	
	.07	$ 620	660	699	739	784	823	863	902	942	981	1060	1139	
	.08	$ 671	710	750	789	835	874	914	953	993	1032	1111	1190	
	.09	$ 722	761	801	840	885	925	964	1004	1043	1083	1162	1241	
	.10	$ 767	806	846	885	931	970	1010	1049	1089	1128	1207	1286	
	.12	$ 868	908	947	987	1032	1073	1111	1151	1190	1230	1309	1388	BALANCE POINT 36 DEG.F.
	.14	$ 964	1004	1043	1083	1128	1168	1207	1247	1286	1326	1405	1484	
	.16	$ 1066	1105	1145	1184	1230	1269	1309	1348	1388	1427	1506	1585	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	122	147	171	196	220	245	294	343	392	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19

ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REC IV

BTUH (17) 16400, COP(17) 2.10

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH		HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
30,000		$	332	383	428	479	524	575	620	671	716	767	812	863	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	344	355	361	372	378	389	400	406	417	423	434	440	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	400	411	417	428	434	445	457	462	473	479	490	496	
	.07	$	451	462	468	479	485	496	507	513	524	530	541	547	
	.08	$	507	519	524	536	541	552	564	569	581	586	598	603	
	.09	$	564	575	581	592	598	609	620	626	637	643	654	660	
	.10	$	620	631	637	648	654	665	677	682	694	699	710	716	
	.12	$	733	744	750	761	767	778	789	795	806	812	823	829	
	.14	$	846	857	863	874	880	891	902	908	919	925	936	942	BALANCE POINT 20 DEG.F.
	.16	$	959	970	976	987	993	1004	1015	1021	1032	1038	1049	1055	
35,000		$	389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	394	411	423	440	457	473	490	507	519	536	552	569	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	451	468	479	496	513	530	547	564	575	592	609	626	
	.07	$	502	519	530	547	564	581	598	615	626	643	660	677	
	.08	$	558	575	586	603	620	637	654	671	682	699	716	733	
	.09	$	615	631	643	660	677	694	710	727	739	756	773	789	
	.10	$	671	688	699	716	733	750	767	784	795	812	829	846	
	.12	$	784	801	812	829	846	863	880	897	908	925	942	959	
	.14	$	897	914	925	942	959	976	993	1010	1021	1038	1055	1072	BALANCE POINT 23 DEG.F.
	.16	$	1010	1026	1038	1055	1072	1089	1105	1122	1134	1151	1168	1184	
40,000		$	445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	445	468	496	524	552	581	603	631	660	688	716	739	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	496	519	547	575	603	631	654	682	710	739	767	789	
	.07	$	547	569	598	626	654	682	705	733	761	789	818	840	
	.08	$	592	615	643	671	699	727	750	778	806	835	863	885	
	.09	$	643	665	694	722	750	778	801	829	857	885	914	936	
	.10	$	694	716	744	773	801	829	852	880	908	936	964	987	
	.12	$	795	818	846	874	902	931	953	981	1010	1038	1066	1089	
	.14	$	897	919	947	976	1004	1032	1055	1083	1111	1139	1168	1190	BALANCE POINT 27 DEG.F.
	.16	$	998	1021	1049	1077	1105	1134	1156	1184	1213	1241	1269	1292	
50,000		$	558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	541	592	637	688	733	784	829	880	925	970	1021	1066	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	586	637	682	733	778	829	874	925	970	1015	1066	1111	
	.07	$	626	677	722	773	818	868	914	964	1010	1056	1105	1151	
	.08	$	671	722	767	818	863	914	959	1010	1055	1100	1151	1196	
	.09	$	710	761	806	857	902	953	998	1049	1094	1139	1190	1235	
	.10	$	756	806	852	901	947	998	1043	1094	1139	1184	1235	1280	
	.12	$	840	891	936	987	1032	1083	1128	1179	1224	1269	1320	1365	
	.14	$	925	976	1021	1072	1117	1168	1213	1263	1309	1354	1405	1450	BALANCE POINT 32 DEG.F.
	.16	$	1010	1060	1105	1156	1201	1252	1297	1348	1393	1438	1489	1534	
60,000		$	671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	648	705	761	823	880	936	993	1049	1105	1168	1224	1280	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	694	750	806	868	925	981	1038	1094	1151	1213	1269	1326	
	.07	$	744	801	857	919	976	1032	1089	1145	1201	1263	1320	1376	
	.08	$	795	852	908	970	1026	1083	1139	1196	1252	1314	1371	1427	
	.09	$	846	902	959	1021	1077	1134	1190	1247	1303	1365	1421	1478	
	.10	$	891	947	1004	1066	1122	1179	1235	1292	1348	1410	1467	1523	
	.12	$	990	1049	1105	1168	1224	1280	1337	1393	1450	1512	1568	1625	BALANCE POINT 36 DEG.F.
	.14	$	1089	1145	1201	1263	1320	1376	1433	1489	1546	1608	1664	1721	
	.16	$	1190	1247	1303	1365	1421	1478	1534	1591	1647	1709	1766	1822	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	122	147	171	196	220	245	294	343	392	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19

ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REG IV

BTUH (17) 16400, COP(17) 2.10

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
30,000		$ 434	473	507	547	581	620	654	694	727	801	874	874	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 361	372	378	383	389	400	406	411	417	434	445	445	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 417	428	434	440	445	457	462	468	473	490	502	502	
	.07	$ 469	479	485	490	496	507	513	519	524	541	552	552	
	.08	$ 524	536	541	547	552	564	569	575	581	598	609	609	
	.09	$ 581	592	598	603	609	620	626	631	637	654	665	665	
	.10	$ 637	648	654	660	665	677	682	688	694	710	722	724	
	.12	$ 750	761	767	773	778	789	795	801	806	823	835	835	BALANCE POINT 20 DEG.F.
	.14	$ 863	874	880	885	891	902	908	914	919	936	947	947	
	.16	$ 976	987	993	998	1004	1015	1021	1026	1032	1049	1060	1060	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 428	440	451	462	473	490	502	513	524	547	575	575	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 485	496	507	519	530	547	558	569	581	603	631	631	
	.07	$ 536	547	558	569	581	598	609	620	631	654	682	682	
	.08	$ 592	603	615	626	637	654	665	677	688	710	739	739	
	.09	$ 648	660	671	682	694	710	722	733	744	767	795	795	
	.10	$ 705	716	727	739	750	767	778	789	801	823	852	852	
	.12	$ 818	829	840	852	863	880	891	902	914	936	964	964	BALANCE POINT 23 DEG.F.
	.14	$ 931	942	953	964	976	993	1004	1015	1026	1049	1077	1077	
	.16	$ 1043	1055	1066	1077	1089	1105	1117	1128	1139	1162	1190	1190	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 502	524	541	564	586	603	626	648	665	705	750	750	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 552	575	592	615	637	654	677	699	716	756	801	801	
	.07	$ 600	626	643	665	688	705	727	750	767	806	852	852	
	.08	$ 648	671	688	710	733	750	773	795	812	852	897	897	
	.09	$ 699	722	739	761	784	801	823	846	863	902	947	947	
	.10	$ 750	773	789	812	835	852	874	897	914	953	998	998	
	.12	$ 852	874	891	914	936	953	976	998	1015	1055	1100	1100	BALANCE POINT 27 DEG.F.
	.14	$ 953	976	993	1015	1038	1055	1077	1100	1117	1156	1201	1201	
	.16	$ 1055	1077	1094	1117	1139	1156	1179	1201	1218	1258	1303	1303	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 643	682	716	756	789	829	863	902	936	1010	1083	1083	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 698	727	761	801	835	874	908	947	981	1055	1128	1128	
	.07	$ 727	767	801	840	874	914	947	987	1021	1094	1168	1168	
	.08	$ 773	812	846	885	919	959	993	1032	1066	1139	1213	1213	
	.09	$ 812	852	885	925	959	998	1032	1071	1105	1179	1252	1252	
	.10	$ 857	897	931	970	1004	1043	1077	1117	1151	1224	1297	1297	
	.12	$ 942	981	1015	1055	1089	1128	1162	1201	1236	1309	1382	1382	BALANCE POINT 32 DEG.F.
	.14	$ 1026	1066	1100	1139	1173	1213	1247	1286	1320	1393	1467	1467	
	.16	$ 1111	1151	1184	1224	1258	1297	1331	1371	1405	1478	1551	1551	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 773	818	857	902	947	993	1032	1077	1122	1207	1297	1297	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 838	863	902	947	993	1038	1077	1122	1168	1253	1342	1342	
	.07	$ 868	911	953	998	1043	1089	1128	1173	1218	1303	1393	1393	
	.08	$ 919	964	1004	1049	1094	1139	1179	1224	1269	1354	1444	1444	
	.09	$ 970	1015	1055	1100	1145	1190	1230	1275	1320	1405	1495	1495	
	.10	$ 1015	1060	1100	1145	1190	1235	1275	1320	1365	1450	1540	1540	
	.12	$ 1117	1162	1201	1247	1292	1337	1376	1421	1467	1551	1642	1642	BALANCE POINT 36 DEG.F.
	.14	$ 1213	1258	1297	1342	1388	1433	1472	1517	1563	1647	1737	1737	
	.16	$ 1314	1359	1399	1444	1489	1534	1574	1619	1664	1749	1839	1839	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	122	147	171	196	220	245	294	343	392	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 29500, SSER 9.50

ARI RATED HEATING CAP.: BTUH (47) 29500, COP(47) 3.00, HSPF 7.00 MIN.DER REG IV

BTUH (17) 16700, COP(17) 2.10

FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
30,000	.05	$ 372	756	
	.06	$ 440	908	
	.07	$ 519	1060	
	.08	$ 586	1213	
	.09	$ 665	1365	
	.10	$ 744	1517	
	.12	$ 891	1822	
	.14	$ 1038	2127	BALANCE POINT 19 DEG.F.
	.16	$ 1184	2431	
35,000	.05	$ 434	885	
	.06	$ 519	1060	
	.07	$ 609	1241	
	.08	$ 699	1416	
	.09	$ 784	1596	
	.10	$ 874	1771	
	.12	$ 1043	2127	
	.14	$ 1218	2482	BALANCE POINT 23 DEG.F.
	.16	$ 1393	2838	
40,000	.05	$ 502	1010	
	.06	$ 603	1213	
	.07	$ 705	1416	
	.08	$ 806	1619	
	.09	$ 908	1822	
	.10	$ 1010	2025	
	.12	$ 1207	2431	
	.14	$ 1410	2838	BALANCE POINT 26 DEG.F.
	.16	$ 1613	3244	
50,000	.05	$ 660	1263	
	.06	$ 795	1517	
	.07	$ 925	1771	
	.08	$ 1060	2025	
	.09	$ 1190	2279	
	.10	$ 1320	2533	
	.12	$ 1585	3041	
	.14	$ 1850	3549	BALANCE POINT 31 DEG.F.
	.16	$ 2115	4057	
60,000	.05	$ 846	1517	
	.06	$ 1015	1824	
	.07	$ 1184	2127	
	.08	$ 1359	2431	
	.09	$ 1529	2736	
	.10	$ 1698	3041	
	.12	$ 2036	3650	
	.14	$ 2369	4260	BALANCE POINT 35 DEG.F.
	.16	$ 2708	4869	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	120	144	168	192	216	240	289	337	385	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 30UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 28600, SEER 9.50

ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REQ IV

BTUH (17) 16700, COP(17) 2.10

FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
30,000		$ 231	265	299	332	361	394	428	462	496	530	598	665	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 321	327	332	338	344	349	355	361	366	378	389	400	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 378	383	389	394	400	406	411	417	423	434	445	457	
	.07	$ 428	434	440	445	451	457	462	468	473	485	496	507	
	.08	$ 485	490	496	502	507	513	519	524	530	541	552	564	
	.09	$ 541	547	552	558	564	569	575	581	586	598	609	620	
	.10	$ 598	603	609	615	620	626	631	637	643	654	665	677	
	.12	$ 705	710	716	722	727	733	739	744	750	761	773	784	
	.14	$ 818	823	829	835	840	846	852	857	863	874	885	897	BALANCE POINT 19 DEG.F.
	.16	$ 925	931	936	942	947	953	959	964	970	981	993	1004	
35,000		$ 270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 355	366	378	389	400	411	417	428	440	451	473	496	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 411	423	434	445	457	468	473	485	496	507	530	552	
	.07	$ 462	473	485	496	507	519	524	536	547	558	581	603	
	.08	$ 519	530	541	552	564	575	581	592	603	615	637	660	
	.09	$ 575	586	598	609	620	631	637	648	660	671	694	716	
	.10	$ 631	643	654	665	677	688	694	705	716	727	750	773	
	.12	$ 739	750	761	773	784	795	801	812	823	835	857	880	
	.14	$ 852	863	874	885	897	908	914	925	936	947	970	993	BALANCE POINT 23 DEG.F.
	.16	$ 959	970	981	993	1004	1015	1021	1032	1043	1055	1077	1100	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 400	411	423	434	451	462	473	485	502	513	536	564	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 457	468	479	490	507	519	530	541	558	569	592	620	
	.07	$ 519	530	541	552	569	581	592	603	620	631	654	682	
	.08	$ 581	592	603	615	631	643	654	665	682	694	716	744	
	.09	$ 643	654	665	677	694	705	716	727	744	756	778	806	
	.10	$ 705	716	727	739	756	767	778	789	806	818	840	868	
	.12	$ 829	840	852	863	880	891	903	914	931	942	964	993	
	.14	$ 953	964	976	987	1004	1015	1026	1038	1055	1066	1089	1117	BALANCE POINT 26 DEG.F.
	.16	$ 1077	1089	1100	1111	1128	1139	1151	1162	1179	1190	1213	1241	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 462	485	507	536	558	581	603	626	648	677	722	767	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 519	541	564	592	615	637	660	682	705	733	778	823	
	.07	$ 581	603	626	654	677	699	722	744	767	795	840	885	
	.08	$ 643	665	688	716	739	761	784	806	829	857	902	947	
	.09	$ 699	722	744	773	795	818	840	863	885	914	959	1004	
	.10	$ 761	784	806	835	857	880	902	925	947	976	1021	1066	
	.12	$ 880	902	925	953	976	998	1021	1043	1066	1094	1139	1184	
	.14	$ 998	1021	1043	1072	1094	1117	1139	1162	1184	1213	1258	1303	BALANCE POINT 31 DEG.F.
	.16	$ 1117	1139	1162	1190	1213	1235	1258	1280	1303	1331	1376	1421	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 519	558	598	637	682	722	761	801	840	880	959	1038	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 569	609	648	688	733	773	812	852	891	931	1010	1089	
	.07	$ 615	654	694	733	778	818	857	897	936	976	1055	1134	
	.08	$ 665	705	744	784	829	868	908	947	987	1026	1105	1184	
	.09	$ 710	750	789	829	874	914	953	993	1032	1072	1151	1230	
	.10	$ 761	801	840	880	925	964	1004	1043	1083	1122	1201	1280	
	.12	$ 857	897	936	976	1021	1060	1100	1139	1179	1218	1297	1376	
	.14	$ 953	993	1032	1072	1117	1156	1196	1235	1275	1314	1393	1472	BALANCE POINT 35 DEG.F.
	.16	$ 1055	1094	1134	1173	1218	1258	1297	1337	1376	1416	1495	1574	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$ 120	144	168	192	216	240	289	337	385	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPOA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPOA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 28800, SEER 9.50

ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 16700, COP(17) 2.10

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
30,000		$ 332	380	428	479	524	575	620	671	716	767	812	863	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 338	349	355	366	372	383	394	400	411	417	428	434	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 394	406	411	423	428	440	451	457	468	473	485	490	
	.07	$ 445	457	462	473	479	490	502	507	519	524	536	541	
	.08	$ 502	513	519	530	536	547	558	564	575	581	592	598	
	.09	$ 558	569	575	586	592	603	615	620	631	637	648	654	
	.10	$ 615	626	631	643	648	660	671	677	688	694	705	710	
	.12	$ 727	733	739	750	756	767	778	784	795	801	812	818	BALANCE POINT 19 DEG.F.
	.14	$ 835	846	852	863	868	880	891	897	908	914	925	931	
	.16	$ 942	953	959	970	976	987	998	1004	1015	1021	1032	1038	
35,000		$ 389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 389	406	417	434	451	468	485	502	513	530	547	564	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 445	462	473	490	507	524	541	558	569	586	603	620	
	.07	$ 496	513	524	541	558	575	592	609	620	637	654	671	
	.08	$ 552	569	581	598	615	631	648	665	677	694	710	727	
	.09	$ 609	626	637	654	671	688	705	722	733	750	767	784	
	.10	$ 665	682	694	710	727	744	761	778	789	806	823	840	
	.12	$ 773	789	801	818	835	852	868	885	897	914	931	947	BALANCE POINT 23 DEG.F.
	.14	$ 885	902	914	931	947	964	981	998	1010	1026	1043	1060	
	.16	$ 993	1010	1021	1038	1055	1072	1089	1105	1117	1134	1151	1168	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 440	457	473	490	513	530	547	564	581	603	620	637	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 496	513	530	547	569	586	603	620	637	660	677	694	
	.07	$ 558	575	592	609	631	648	665	682	699	722	739	756	
	.08	$ 620	637	654	671	694	710	727	744	761	784	801	818	
	.09	$ 682	699	716	733	756	773	789	806	823	846	863	880	
	.10	$ 744	761	778	795	818	835	852	868	885	908	925	942	
	.12	$ 866	885	902	919	942	959	976	993	1010	1032	1049	1066	BALANCE POINT 26 DEG.F.
	.14	$ 993	1010	1026	1043	1066	1083	1100	1117	1134	1156	1173	1190	
	.16	$ 1117	1134	1151	1168	1190	1207	1224	1241	1258	1280	1297	1314	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 536	569	603	637	671	705	739	773	806	840	874	908	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 592	626	660	694	727	761	795	829	863	897	931	964	
	.07	$ 664	688	722	756	789	823	857	891	925	959	993	1026	
	.08	$ 716	750	784	818	852	885	919	953	987	1021	1055	1089	
	.09	$ 773	806	840	874	908	942	976	1010	1043	1077	1111	1145	
	.10	$ 835	868	902	936	970	1004	1038	1072	1105	1139	1173	1207	
	.12	$ 953	987	1021	1055	1089	1122	1156	1190	1224	1258	1292	1326	BALANCE POINT 31 DEG.F.
	.14	$ 1072	1106	1139	1173	1207	1241	1275	1309	1342	1376	1410	1444	
	.16	$ 1190	1224	1258	1292	1326	1359	1393	1427	1461	1495	1529	1563	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 643	699	756	818	874	931	987	1043	1100	1162	1218	1275	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 694	750	806	868	925	981	1038	1094	1151	1213	1269	1326	
	.07	$ 739	795	852	914	970	1026	1083	1139	1196	1258	1314	1371	
	.08	$ 789	846	902	964	1021	1077	1134	1190	1247	1309	1365	1421	
	.09	$ 835	891	947	1010	1066	1122	1179	1235	1292	1354	1410	1467	
	.10	$ 885	942	998	1060	1117	1173	1230	1286	1342	1405	1461	1517	
	.12	$ 981	1038	1094	1156	1213	1269	1326	1382	1438	1500	1557	1613	BALANCE POINT 35 DEG.F.
	.14	$ 1077	1134	1190	1252	1309	1365	1421	1478	1534	1596	1653	1709	
	.16	$ 1179	1235	1292	1354	1410	1467	1523	1579	1636	1698	1754	1811	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	120	144	168	192	216	240	289	337	385	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 30UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 28800, SEER 9.50

ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 16700, COP(17) 2.10

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
30,000		$ 434	473	507	547	581	620	654	694	727	801	874	874	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 355	366	372	378	383	394	400	406	411	428	440	440	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 411	423	428	434	440	451	457	462	468	485	496	496	
	.07	$ 462	473	479	485	490	502	507	513	519	536	547	547	
	.08	$ 519	530	536	541	547	558	564	569	575	592	603	603	
	.09	$ 575	586	591	598	603	615	620	626	631	648	660	660	
	.10	$ 631	643	648	654	660	671	677	683	688	705	716	716	
	.12	$ 739	750	756	761	767	778	784	789	795	813	823	823	
	.14	$ 852	863	868	874	880	891	897	902	908	925	936	936	BALANCE POINT 19 DEG.F.
	.16	$ 959	970	976	981	987	998	1004	1010	1015	1032	1043	1043	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 423	434	445	457	468	485	496	507	519	541	569	569	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 479	490	502	513	524	541	552	564	575	598	626	626	
	.07	$ 530	541	553	564	575	592	603	615	626	648	677	677	
	.08	$ 586	598	609	620	631	648	660	671	682	705	733	733	
	.09	$ 643	654	665	677	688	705	716	727	739	761	789	789	
	.10	$ 699	710	722	733	744	761	773	784	795	818	846	846	
	.12	$ 806	818	829	840	852	868	880	891	902	925	953	953	
	.14	$ 919	931	942	953	964	981	993	1004	1015	1038	1066	1066	BALANCE POINT 23 DEG.F.
	.16	$ 1026	1038	1049	1060	1072	1089	1100	1111	1122	1145	1173	1173	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 419	490	502	519	530	547	558	575	586	615	643	643	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 536	547	558	575	586	603	615	631	643	671	699	699	
	.07	$ 598	609	620	637	648	665	677	694	705	733	761	761	
	.08	$ 660	671	682	699	710	727	739	756	767	795	823	823	
	.09	$ 722	733	744	761	773	789	801	818	829	857	885	885	
	.10	$ 784	795	806	823	835	852	863	880	891	919	947	947	
	.12	$ 908	919	931	947	959	976	987	1004	1015	1043	1072	1072	
	.14	$ 1032	1043	1055	1072	1083	1100	1111	1128	1139	1168	1196	1196	BALANCE POINT 26 DEG.F.
	.16	$ 1156	1168	1179	1196	1207	1224	1235	1252	1263	1292	1320	1320	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 609	631	660	688	710	739	761	789	812	868	919	919	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 665	688	716	744	767	795	818	846	868	925	976	976	
	.07	$ 727	750	778	806	829	857	880	908	931	987	1038	1038	
	.08	$ 789	812	840	868	891	919	942	970	993	1049	1100	1100	
	.09	$ 846	868	897	925	947	976	998	1026	1049	1105	1156	1156	
	.10	$ 908	931	959	987	1010	1038	1060	1089	1111	1168	1218	1218	
	.12	$ 1026	1049	1077	1105	1128	1156	1179	1207	1230	1286	1337	1337	
	.14	$ 1145	1168	1196	1224	1247	1275	1297	1326	1348	1405	1455	1455	BALANCE POINT 31 DEG.F.
	.16	$ 1263	1286	1314	1342	1365	1393	1416	1444	1467	1523	1574	1574	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 767	812	852	897	942	987	1026	1072	1117	1201	1292	1292	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 818	863	902	947	993	1038	1077	1122	1168	1252	1342	1342	
	.07	$ 863	908	947	993	1038	1083	1122	1168	1213	1297	1388	1388	
	.08	$ 914	959	998	1043	1089	1134	1173	1218	1263	1348	1438	1438	
	.09	$ 959	1004	1043	1089	1134	1179	1218	1263	1309	1393	1484	1484	
	.10	$ 1010	1055	1094	1139	1184	1230	1269	1314	1359	1444	1534	1534	
	.12	$ 1105	1151	1190	1235	1280	1326	1365	1410	1455	1540	1630	1630	
	.14	$ 1201	1247	1286	1331	1376	1421	1461	1506	1551	1636	1726	1726	BALANCE POINT 35 DEG.F.
	.16	$ 1303	1348	1388	1433	1478	1523	1563	1608	1653	1737	1828	1828	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	120	144	168	192	216	240	289	337	385	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69

ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV

BTUH (17) 20000, COP(17) 2.20

FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
35,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05 $	434	885	
	.06 $	524	1060	
	.07 $	603	1241	
	.08 $	694	1416	
	.09 $	784	1596	
	.10 $	868	1771	
	.12 $	1043	2127	
	.14 $	1218	2482	BALANCE POINT 19 DEG.F.
	.16 $	1388	2838	
40,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05 $	502	1010	
	.06 $	603	1213	
	.07 $	699	1416	
	.08 $	801	1619	
	.09 $	897	1822	
	.10 $	998	2025	
	.12 $	1201	2431	
	.14 $	1399	2838	BALANCE POINT 22 DEG.F.
	.16 $	1596	3244	
50,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05 $	648	1263	
	.06 $	778	1517	
	.07 $	908	1771	
	.08 $	1032	2025	
	.09 $	1168	2279	
	.10 $	1297	2533	
	.12 $	1557	3041	
	.14 $	1811	3549	BALANCE POINT 28 DEG.F.
	.16 $	2070	4057	
60,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05 $	812	1517	
	.06 $	976	1821	
	.07 $	1145	2127	
	.08 $	1309	2431	
	.09 $	1467	2736	
	.10 $	1630	3041	
	.12 $	1957	3650	
	.14 $	2285	4260	BALANCE POINT 33 DEG.F.
	.16 $	2606	4869	
70,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05 $	1004	1771	
	.06 $	1201	2127	
	.07 $	1399	2482	
	.08 $	1608	2838	
	.09 $	1805	3193	
	.10 $	2003	3549	
	.12 $	2403	4260	
	.14 $	2810	4971	BALANCE POINT 36 DEG.F.
	.16 $	3210	5682	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	151	182	212	243	273	303	364	425	486	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69

ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REQ IV

BTUH (17) 20000, COP(17) 2.20

FURNACE TYPE NATURAL GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
35,000		$ 270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 383	389	400	406	411	417	428	434	440	445	462	479	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 445	451	462	468	473	479	490	496	502	507	524	541	
	.07	$ 513	519	530	536	541	547	559	564	569	575	592	609	
	.08	$ 581	586	598	603	609	615	626	631	637	643	660	677	
	.09	$ 648	654	665	671	677	682	694	699	705	710	727	744	
	.10	$ 710	716	727	733	739	744	756	761	767	773	789	806	
	.12	$ 846	852	863	868	874	880	891	897	902	908	925	942	
	.14	$ 976	981	993	998	1004	1010	1021	1026	1032	1038	1055	1072	BALANCE POINT 19 DEG.F.
	.16	$ 1111	1117	1128	1134	1139	1145	1156	1162	1168	1173	1190	1207	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 417	428	440	451	468	479	490	502	519	530	552	581	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 479	490	502	513	530	541	552	564	581	592	615	643	
	.07	$ 547	558	569	581	598	609	620	631	648	660	682	710	
	.08	$ 615	626	637	648	665	677	688	699	716	727	750	778	
	.09	$ 677	688	699	710	727	739	750	761	778	789	812	840	
	.10	$ 744	756	767	778	795	806	818	829	846	857	880	908	
	.12	$ 874	885	897	908	925	936	947	959	976	987	1010	1038	
	.14	$ 1004	1015	1026	1038	1055	1066	1077	1089	1105	1117	1139	1168	BALANCE POINT 22 DEG.F.
	.16	$ 1134	1145	1156	1168	1184	1196	1207	1218	1235	1247	1269	1297	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 485	507	530	558	581	603	626	648	671	699	744	789	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 547	569	592	620	643	665	688	710	733	761	806	852	
	.07	$ 609	631	654	682	705	727	750	773	795	823	868	914	
	.08	$ 671	694	716	744	767	789	813	835	857	885	931	976	
	.09	$ 739	761	784	812	835	857	880	902	925	953	998	1043	
	.10	$ 801	823	846	874	897	919	942	964	987	1015	1060	1105	
	.12	$ 931	953	976	1004	1026	1049	1072	1094	1117	1145	1190	1235	
	.14	$ 1055	1077	1100	1128	1151	1173	1196	1218	1241	1269	1314	1359	BALANCE POINT 28 DEG.F.
	.16	$ 1184	1207	1230	1258	1280	1303	1326	1348	1371	1399	1444	1489	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 536	575	615	654	699	739	778	818	857	897	976	1055	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 586	626	665	705	750	789	829	868	908	947	1026	1105	
	.07	$ 643	682	722	761	806	846	885	925	964	1004	1083	1162	
	.08	$ 694	733	773	817	857	897	936	976	1015	1055	1134	1213	
	.09	$ 744	784	823	863	908	947	987	1026	1066	1105	1184	1263	
	.10	$ 795	835	874	914	959	998	1038	1077	1117	1156	1235	1314	
	.12	$ 902	942	981	1021	1066	1105	1145	1184	1224	1263	1342	1421	
	.14	$ 1004	1043	1083	1123	1168	1207	1247	1286	1326	1365	1444	1523	BALANCE POINT 33 DEG.F.
	.16	$ 1111	1151	1190	1230	1275	1314	1354	1393	1433	1472	1551	1630	
70,000		$ 541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 626	671	716	761	806	857	902	947	993	1043	1134	1224	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 682	727	772	819	863	914	959	1004	1049	1100	1190	1280	
	.07	$ 744	789	835	880	925	976	1021	1066	1111	1162	1252	1342	
	.08	$ 801	846	891	936	981	1032	1077	1122	1168	1218	1309	1399	
	.09	$ 863	908	953	998	1043	1094	1139	1184	1230	1280	1371	1461	
	.10	$ 919	964	1010	1055	1100	1151	1196	1241	1286	1337	1427	1517	
	.12	$ 1038	1083	1128	1173	1218	1269	1314	1359	1405	1455	1546	1636	
	.14	$ 1156	1201	1247	1292	1337	1388	1433	1478	1523	1574	1664	1754	BALANCE POINT 36 DEG.F.
	.16	$ 1275	1320	1365	1410	1455	1506	1551	1596	1642	1692	1783	1873	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	151	182	212	243	273	303	364	425	486	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36URPQA/A36AQ-A
HEAT PUMP MODEL: OUTDOOR 36URPQA — INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, COP(17) 2.20
FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
35,000		$ 389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 406	417	428	434	445	457	468	479	490	502	507	519	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 468	479	490	496	507	519	530	541	552	564	569	581	
	.07	$ 536	547	558	564	575	586	598	609	620	631	637	648	
	.08	$ 603	615	626	631	643	654	665	677	688	699	705	716	
	.09	$ 671	683	694	699	710	722	733	744	756	767	773	784	
	.10	$ 733	744	756	761	773	784	795	806	818	829	835	846	
	.12	$ 868	880	891	897	908	919	931	942	953	964	970	981	
	.14	$ 990	1010	1021	1026	1038	1049	1060	1072	1083	1094	1100	1111	BALANCE POINT 19 DEG.F.
	.16	$ 1134	1145	1156	1162	1173	1184	1196	1207	1218	1230	1235	1247	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 457	473	490	507	530	547	564	581	598	620	637	654	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 519	536	552	569	592	609	626	643	660	682	699	716	
	.07	$ 586	603	620	637	660	677	694	710	727	750	767	784	
	.08	$ 654	671	688	705	727	744	761	778	795	818	835	852	
	.09	$ 716	733	750	767	789	806	823	840	857	880	897	914	
	.10	$ 784	801	818	835	857	874	891	908	925	947	964	981	
	.12	$ 914	931	947	964	981	1004	1021	1038	1055	1077	1094	1111	
	.14	$ 1043	1060	1077	1094	1117	1134	1151	1168	1184	1207	1224	1241	BALANCE POINT 22 DEG.F.
	.16	$ 1173	1190	1207	1224	1247	1263	1280	1297	1314	1337	1354	1371	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 558	592	626	660	694	727	761	795	829	863	897	931	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 620	654	688	722	756	789	823	857	891	925	959	993	
	.07	$ 682	716	750	784	818	852	885	919	953	987	1021	1055	
	.08	$ 744	778	812	846	880	914	947	981	1015	1049	1083	1117	
	.09	$ 812	846	880	914	947	981	1015	1049	1083	1117	1151	1184	
	.10	$ 874	908	942	976	1010	1043	1077	1111	1145	1179	1213	1247	
	.12	$ 1004	1038	1072	1105	1139	1173	1207	1241	1275	1309	1342	1376	
	.14	$ 1128	1162	1196	1230	1263	1297	1331	1365	1399	1433	1467	1500	BALANCE POINT 28 DEG.F.
	.16	$ 1258	1292	1326	1359	1393	1427	1461	1495	1529	1563	1596	1630	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 660	716	773	835	891	947	1004	1060	1117	1179	1235	1292	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 710	767	823	885	942	998	1055	1111	1168	1230	1286	1342	
	.07	$ 767	823	880	942	998	1055	1111	1168	1224	1286	1342	1399	
	.08	$ 818	874	931	993	1049	1105	1162	1218	1275	1337	1393	1450	
	.09	$ 868	925	981	1043	1100	1156	1213	1269	1326	1388	1444	1500	
	.10	$ 919	976	1032	1094	1151	1207	1263	1320	1376	1438	1495	1551	
	.12	$ 1026	1083	1139	1201	1258	1314	1371	1427	1484	1546	1602	1658	
	.14	$ 1128	1184	1241	1303	1359	1416	1472	1529	1585	1647	1704	1760	BALANCE POINT 33 DEG.F.
	.16	$ 1235	1292	1348	1410	1467	1523	1579	1636	1692	1754	1811	1867	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 767	835	902	970	1032	1100	1168	1235	1303	1371	1438	1500	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 823	891	959	1026	1089	1156	1224	1292	1359	1427	1495	1557	
	.07	$ 885	953	1021	1089	1151	1218	1286	1354	1421	1489	1557	1619	
	.08	$ 942	1010	1077	1145	1207	1275	1342	1410	1478	1546	1613	1675	
	.09	$ 1004	1072	1139	1207	1269	1337	1405	1472	1540	1608	1675	1737	
	.10	$ 1060	1128	1196	1263	1326	1393	1461	1529	1596	1664	1731	1794	
	.12	$ 1179	1247	1314	1382	1444	1512	1579	1647	1715	1783	1850	1912	
	.14	$ 1297	1365	1433	1500	1563	1630	1698	1766	1833	1901	1969	2031	BALANCE POINT 36 DEG.F.
	.16	$ 1416	1484	1551	1619	1681	1749	1816	1884	1952	2020	2087	2149	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	151	182	212	243	273	303	364	425	486	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A36AC-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AD-A

ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69

ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV

BTUH (17) 20000, COP(17) 2.20

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 428	434	445	451	462	468	473	485	490	507	524	524	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 490	496	507	513	524	530	536	547	552	569	586	586	
	.07	$ 558	564	575	581	592	598	603	615	620	637	654	654	
	.08	$ 626	631	643	648	660	665	671	682	688	705	722	722	
	.09	$ 694	699	710	716	727	733	739	750	756	773	789	789	
	.10	$ 756	761	773	778	789	795	801	812	818	835	852	852	
	.12	$ 891	897	908	914	925	931	936	947	953	970	987	987	BALANCE POINT 19 DEG.F.
	.14	$ 1021	1026	1038	1043	1055	1060	1066	1077	1083	1100	1117	1117	
	.16	$ 1156	1162	1173	1179	1190	1196	1201	1213	1218	1235	1252	1252	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 496	507	519	536	547	564	575	592	603	631	660	660	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 558	569	581	598	609	626	637	654	665	694	722	722	
	.07	$ 626	637	648	665	677	694	705	722	733	761	789	789	
	.08	$ 694	705	716	733	744	761	773	789	801	829	857	857	
	.09	$ 756	767	778	795	806	823	835	852	863	891	919	919	
	.10	$ 823	835	846	863	874	891	902	919	931	959	987	987	
	.12	$ 953	964	976	993	1004	1021	1032	1049	1060	1089	1117	1117	BALANCE POINT 22 DEG.F.
	.14	$ 1083	1094	1105	1122	1134	1151	1162	1179	1190	1218	1247	1247	
	.16	$ 1213	1224	1235	1252	1263	1280	1292	1309	1320	1348	1376	1376	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 631	654	682	710	733	761	784	812	835	891	942	942	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 694	716	744	773	795	823	846	874	897	953	1004	1004	
	.07	$ 756	778	806	835	857	885	908	936	959	1015	1066	1066	
	.08	$ 818	840	868	897	919	947	970	998	1021	1077	1128	1128	
	.09	$ 885	908	936	964	987	1015	1038	1066	1089	1145	1196	1196	
	.10	$ 947	970	998	1026	1049	1077	1100	1128	1151	1207	1258	1258	
	.12	$ 1077	1100	1128	1156	1179	1207	1230	1258	1280	1337	1388	1388	BALANCE POINT 28 DEG.F.
	.14	$ 1201	1224	1252	1280	1303	1331	1354	1382	1405	1461	1512	1512	
	.16	$ 1331	1354	1382	1410	1433	1461	1484	1512	1534	1591	1642	1642	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 784	829	868	914	959	1004	1043	1089	1134	1218	1309	1309	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 835	880	919	964	1010	1055	1094	1139	1184	1269	1359	1359	
	.07	$ 891	936	976	1021	1066	1111	1151	1196	1241	1326	1416	1416	
	.08	$ 942	987	1026	1072	1117	1162	1201	1247	1292	1376	1467	1467	
	.09	$ 993	1038	1077	1122	1168	1213	1252	1297	1342	1427	1517	1517	
	.10	$ 1043	1089	1128	1173	1218	1263	1303	1348	1393	1478	1568	1568	
	.12	$ 1151	1196	1235	1280	1326	1371	1410	1455	1500	1585	1675	1675	BALANCE POINT 33 DEG.F.
	.14	$ 1252	1297	1337	1382	1427	1472	1512	1557	1602	1687	1777	1777	
	.16	$ 1359	1405	1444	1489	1534	1579	1619	1664	1709	1794	1884	1884	
70,000		$ 1021	1105	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 908	959	1010	1066	1117	1168	1218	1269	1320	1421	1523	1523	THEORETICAL HEATING COST * FURN.* HEAT PUMP $ PER YEAR
	.06	$ 964	1015	1066	1122	1173	1224	1275	1326	1376	1478	1579	1579	
	.07	$ 1026	1077	1128	1184	1235	1286	1337	1388	1438	1540	1642	1642	
	.08	$ 1083	1134	1184	1241	1292	1342	1393	1444	1495	1596	1698	1698	
	.09	$ 1145	1196	1247	1303	1354	1405	1455	1506	1557	1658	1760	1760	
	.10	$ 1201	1252	1303	1359	1410	1461	1512	1563	1613	1715	1816	1816	
	.12	$ 1320	1371	1421	1478	1529	1579	1630	1681	1732	1833	1935	1935	BALANCE POINT 36 DEG.F.
	.14	$ 1438	1489	1540	1596	1647	1698	1749	1799	1850	1952	2053	2053	
	.16	$ 1557	1608	1658	1715	1766	1816	1867	1918	1969	2070	2172	2172	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	151	182	212	243	273	303	364	425	486	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 20400, COP(17) 2.00

FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
35,000				
	.05	$ 440	885	
	.06	$ 530	1060	
	.07	$ 615	1241	
	.08	$ 705	1416	
	.09	$ 789	1596	
	.10	$ 880	1771	
	.12	$ 1049	2127	
	.14	$ 1224	2482	BALANCE POINT 18 DEG.F.
	.16	$ 1394	2838	
40,000				
	.05	$ 502	1010	
	.06	$ 603	1213	
	.07	$ 699	1416	
	.08	$ 806	1619	
	.09	$ 902	1822	
	.10	$ 1004	2025	
	.12	$ 1207	2431	
	.14	$ 1410	2838	BALANCE POINT 22 DEG.F.
	.16	$ 1608	3244	
50,000				
	.05	$ 648	1263	
	.06	$ 773	1517	
	.07	$ 902	1771	
	.08	$ 1032	2025	
	.09	$ 1162	2279	
	.10	$ 1292	2533	
	.12	$ 1551	3041	
	.14	$ 1811	3549	BALANCE POINT 28 DEG.F.
	.16	$ 2070	4057	
60,000				
	.05	$ 813	1517	
	.06	$ 970	1822	
	.07	$ 1139	2127	
	.08	$ 1297	2431	
	.09	$ 1461	2736	
	.10	$ 1619	3041	
	.12	$ 1946	3650	
	.14	$ 2268	4260	BALANCE POINT 32 DEG.F.
	.16	$ 2595	4869	
70,000				
	.05	$ 993	1771	
	.06	$ 1196	2127	
	.07	$ 1393	2482	
	.08	$ 1596	2838	
	.09	$ 1794	3193	
	.10	$ 1991	3549	
	.12	$ 2388	4260	
	.14	$ 2787	4971	BALANCE POINT 36 DEG.F.
	.16	$ 3188	5682	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	143	172	201	229	258	287	344	402	459	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 20400, COP(17) 2.00

FURNACE TYPE NATURAL GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
35,000		$ 270	310	344	383	423	462	502	541	581	620	694	773	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 378	383	394	400	406	411	423	428	434	440	457	473	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 445	451	462	468	473	479	490	496	502	507	524	541	
	.07	$ 507	513	524	530	536	541	552	558	564	569	586	603	
	.08	$ 575	581	592	598	603	609	620	626	631	637	654	671	
	.09	$ 643	648	660	665	671	677	688	694	699	705	722	739	
	.10	$ 705	710	722	727	733	739	750	756	761	767	784	801	
	.12	$ 840	846	857	863	868	874	885	891	897	902	919	936	BALANCE POINT 18 DEG.F.
	.14	$ 970	976	987	993	998	1004	1015	1021	1026	1032	1049	1066	
	.16	$ 1100	1105	1117	1122	1128	1134	1145	1151	1156	1162	1179	1196	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 411	423	434	445	462	473	485	496	513	524	547	575	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 472	485	496	507	524	536	547	558	575	586	609	637	
	.07	$ 536	547	558	569	586	598	609	620	637	648	671	699	
	.08	$ 603	615	626	637	654	665	677	688	705	716	739	767	
	.09	$ 665	677	688	699	716	727	739	750	767	778	801	829	
	.10	$ 733	744	756	767	784	795	806	818	835	846	868	897	
	.12	$ 857	868	880	891	908	919	931	942	959	970	993	1021	BALANCE POINT 22 DEG.F.
	.14	$ 987	998	1010	1021	1038	1049	1060	1072	1089	1100	1122	1151	
	.16	$ 1117	1128	1139	1151	1168	1179	1190	1201	1218	1230	1252	1280	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 473	496	519	547	569	592	615	637	660	688	733	778	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 534	558	581	609	631	654	677	699	722	750	795	840	
	.07	$ 598	620	643	671	694	716	739	761	784	812	857	902	
	.08	$ 660	682	705	733	756	778	801	823	846	874	919	964	
	.09	$ 722	744	767	795	818	840	863	885	908	936	981	1026	
	.10	$ 784	806	829	857	880	902	925	947	970	998	1043	1089	
	.12	$ 902	925	947	976	998	1021	1043	1066	1089	1117	1162	1207	BALANCE POINT 28 DEG.F.
	.14	$ 1026	1049	1072	1100	1122	1145	1168	1190	1213	1241	1286	1331	
	.16	$ 1151	1173	1196	1224	1247	1269	1292	1314	1337	1365	1410	1455	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 524	564	603	643	686	727	767	806	846	885	964	1043	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 575	615	654	694	739	778	818	857	897	936	1015	1094	
	.07	$ 626	665	705	744	789	829	868	908	947	987	1066	1145	
	.08	$ 677	716	756	795	840	880	919	959	998	1038	1117	1196	
	.09	$ 722	761	801	840	885	925	964	1004	1043	1083	1162	1241	
	.10	$ 773	812	852	891	936	976	1015	1055	1094	1134	1213	1292	
	.12	$ 874	914	953	993	1038	1077	1117	1156	1196	1235	1314	1393	BALANCE POINT 32 DEG.F.
	.14	$ 976	1015	1055	1094	1139	1179	1218	1258	1297	1337	1416	1495	
	.16	$ 1072	1111	1151	1190	1235	1275	1314	1354	1393	1433	1512	1591	
70,000		$ 541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 609	654	699	744	789	840	885	931	976	1026	1117	1207	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 665	710	756	801	846	897	942	987	1032	1083	1173	1263	
	.07	$ 722	767	812	857	902	953	998	1043	1089	1139	1230	1320	
	.08	$ 778	823	868	914	959	1010	1055	1100	1145	1196	1286	1376	
	.09	$ 835	880	925	970	1015	1066	1111	1156	1201	1252	1342	1433	
	.10	$ 891	936	981	1026	1072	1122	1168	1213	1258	1309	1399	1489	
	.12	$ 1010	1055	1100	1145	1190	1241	1286	1331	1376	1427	1517	1608	BALANCE POINT 36 DEG.F.
	.14	$ 1122	1168	1213	1258	1303	1354	1399	1444	1489	1540	1630	1721	
	.16	$ 1235	1280	1326	1371	1416	1467	1512	1557	1602	1653	1743	1833	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	143	172	201	229	258	287	344	402	459	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 20400, COP(17) 2.00

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
35,000		$ 389	445	502	558	615	671	727	784	835	891	947	1004	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 400	411	423	428	440	451	462	473	485	496	502	513	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 468	479	490	496	507	519	530	541	552	564	569	581	
	.07	$ 530	541	552	558	569	581	592	603	615	626	631	643	
	.08	$ 598	609	620	626	637	648	660	671	682	694	699	710	
	.09	$ 665	677	688	694	705	716	727	739	750	761	767	778	
	.10	$ 727	739	750	756	767	778	789	801	812	823	829	840	
	.12	$ 863	874	885	891	902	914	925	936	947	959	964	976	
	.14	$ 993	1004	1015	1021	1032	1043	1055	1066	1077	1089	1094	1105	BALANCE POINT 18 DEG.F.
	.16	$ 1122	1134	1145	1151	1162	1173	1184	1196	1207	1218	1224	1235	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 461	468	485	502	524	541	558	575	592	615	631	648	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 513	530	547	564	586	603	620	637	654	677	694	710	
	.07	$ 575	592	609	626	648	665	682	699	716	739	756	773	
	.08	$ 643	660	677	694	716	733	750	767	784	806	823	840	
	.09	$ 705	722	739	756	778	795	812	829	846	868	885	902	
	.10	$ 773	789	806	823	846	863	880	897	914	936	953	970	
	.12	$ 897	914	931	947	970	987	1004	1021	1038	1060	1077	1094	
	.14	$ 1026	1043	1060	1077	1100	1117	1134	1151	1168	1190	1207	1224	BALANCE POINT 22 DEG.F.
	.16	$ 1156	1173	1190	1207	1230	1247	1263	1280	1297	1320	1337	1354	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 547	581	615	648	682	716	750	784	818	852	885	919	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 609	643	677	710	744	778	812	845	880	914	947	981	
	.07	$ 671	705	739	773	806	840	874	908	942	976	1010	1043	
	.08	$ 739	767	801	835	868	902	936	970	1004	1038	1072	1105	
	.09	$ 795	829	863	897	931	964	998	1032	1066	1100	1134	1168	
	.10	$ 857	891	925	959	993	1026	1060	1094	1128	1162	1196	1230	
	.12	$ 976	1010	1043	1077	1111	1145	1179	1213	1247	1280	1314	1348	
	.14	$ 1100	1134	1168	1201	1235	1269	1303	1337	1371	1405	1438	1472	BALANCE POINT 28 DEG.F.
	.16	$ 1224	1258	1292	1326	1359	1393	1427	1461	1495	1529	1563	1596	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 648	705	761	823	880	936	993	1049	1105	1168	1224	1280	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 699	756	818	874	931	987	1043	1100	1156	1218	1275	1331	
	.07	$ 750	806	863	925	981	1038	1094	1151	1207	1269	1326	1382	
	.08	$ 801	857	914	976	1032	1089	1145	1201	1258	1320	1376	1433	
	.09	$ 846	902	959	1021	1077	1134	1190	1247	1303	1365	1421	1478	
	.10	$ 897	953	1010	1072	1128	1184	1241	1297	1354	1416	1472	1529	
	.12	$ 998	1055	1111	1173	1230	1286	1342	1399	1455	1517	1574	1630	
	.14	$ 1100	1156	1213	1275	1331	1388	1444	1500	1567	1619	1675	1732	BALANCE POINT 32 DEG.F.
	.16	$ 1196	1252	1309	1371	1427	1484	1540	1596	1653	1715	1771	1828	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 750	818	885	953	1015	1083	1151	1218	1286	1354	1421	1484	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 806	874	942	1010	1072	1139	1207	1275	1342	1410	1478	1540	
	.07	$ 863	931	998	1066	1128	1196	1263	1331	1398	1467	1534	1596	
	.08	$ 919	987	1055	1122	1184	1252	1320	1388	1455	1523	1591	1653	
	.09	$ 976	1043	1111	1179	1241	1309	1376	1444	1512	1579	1647	1709	
	.10	$ 1032	1100	1168	1235	1297	1365	1433	1500	1568	1636	1704	1766	
	.12	$ 1151	1218	1286	1354	1416	1484	1551	1619	1687	1754	1822	1884	
	.14	$ 1263	1331	1399	1467	1529	1596	1664	1732	1799	1867	1935	1997	BALANCE POINT 36 DEG.F.
	.16	$ 1376	1444	1512	1579	1642	1709	1777	1845	1912	1980	2048	2110	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	143	172	201	229	258	287	344	402	459	<--THEORETICAL AIR CONDITIONING COST

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REGION 4 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DEF REG IV
BTUH (17) 20400, COP(17) 2.00

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
35,000		$ 507	552	592	637	682	722	767	806	852	936	1021	1021	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 423	428	440	445	457	462	468	479	485	502	519	519	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 490	496	507	513	524	530	536	547	552	569	586	586	
	.07	$ 552	558	569	575	586	592	598	609	615	631	648	648	
	.08	$ 620	626	637	643	654	660	665	677	682	699	716	716	
	.09	$ 688	694	705	710	722	727	733	744	750	767	784	784	
	.10	$ 750	756	767	773	784	789	795	806	812	829	846	846	
	.12	$ 885	891	902	908	919	925	931	942	947	964	981	981	BALANCE POINT 18 DEG.F.
	.14	$ 1015	1021	1032	1038	1049	1055	1060	1072	1077	1094	1111	1111	
	.16	$ 1145	1151	1162	1168	1179	1184	1190	1201	1207	1224	1241	1241	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 490	502	513	530	541	558	569	586	598	626	654	654	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 552	564	575	592	603	620	631	648	660	688	716	716	
	.07	$ 615	626	637	654	665	682	694	710	722	750	778	778	
	.08	$ 682	694	705	722	733	750	761	778	789	818	846	846	
	.09	$ 744	756	767	784	795	812	823	840	852	880	908	908	
	.10	$ 812	823	835	852	863	880	891	908	919	947	976	976	
	.12	$ 936	947	959	976	987	1004	1015	1032	1043	1072	1100	1100	BALANCE POINT 22 DEG.F.
	.14	$ 1066	1077	1089	1105	1117	1134	1145	1162	1172	1201	1230	1230	
	.16	$ 1196	1207	1218	1235	1247	1263	1275	1292	1303	1331	1359	1359	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 620	643	671	699	722	750	773	801	823	880	931	931	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 682	705	733	761	784	812	835	863	885	942	993	993	
	.07	$ 744	767	795	823	846	874	897	925	947	1004	1055	1055	
	.08	$ 806	829	857	885	908	936	959	987	1010	1066	1117	1117	
	.09	$ 868	891	919	947	970	998	1021	1049	1072	1128	1179	1179	
	.10	$ 931	953	981	1010	1032	1060	1083	1111	1134	1190	1241	1241	
	.12	$ 1049	1072	1100	1128	1151	1179	1201	1230	1252	1309	1359	1359	BALANCE POINT 28 DEG.F.
	.14	$ 1113	1196	1224	1252	1275	1303	1326	1354	1376	1433	1484	1484	
	.16	$ 1297	1320	1348	1376	1399	1427	1450	1478	1500	1557	1608	1608	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 773	818	857	902	947	993	1032	1077	1122	1207	1297	1297	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 823	868	908	953	998	1043	1083	1128	1173	1258	1348	1348	
	.07	$ 874	919	959	1004	1049	1094	1134	1179	1224	1309	1399	1399	
	.08	$ 925	970	1010	1055	1100	1145	1184	1230	1275	1359	1450	1450	
	.09	$ 970	1015	1055	1100	1145	1190	1230	1275	1320	1405	1495	1495	
	.10	$ 1021	1066	1105	1151	1196	1241	1280	1326	1371	1455	1546	1546	
	.12	$ 1122	1168	1207	1252	1297	1342	1382	1427	1472	1557	1647	1647	BALANCE POINT 32 DEG.F.
	.14	$ 1224	1269	1309	1354	1399	1444	1484	1529	1574	1658	1749	1749	
	.16	$ 1320	1365	1405	1450	1495	1540	1579	1625	1670	1754	1845	1845	
70,000		$ 1021	1105	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 891	942	993	1049	1100	1151	1201	1252	1303	1405	1506	1506	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 947	998	1049	1105	1156	1207	1258	1309	1359	1461	1563	1563	
	.07	$ 1004	1055	1105	1162	1213	1263	1314	1365	1416	1517	1619	1619	
	.08	$ 1060	1111	1162	1218	1269	1320	1371	1421	1472	1574	1675	1675	
	.09	$ 1117	1168	1218	1275	1326	1376	1427	1478	1529	1630	1732	1732	
	.10	$ 1173	1224	1275	1331	1382	1433	1484	1534	1585	1687	1788	1788	
	.12	$ 1292	1342	1393	1450	1500	1551	1602	1653	1704	1805	1907	1907	BALANCE POINT 36 DEG.F.
	.14	$ 1405	1455	1506	1563	1613	1664	1715	1766	1816	1918	2020	2020	
	.16	$ 1517	1568	1619	1675	1726	1777	1828	1878	1929	2031	2132	2132	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	143	172	201	229	258	287	344	402	459	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 42UHPOA/A61AC-A
HEAT PUMP MODEL: OUTDOOR 42UHPOA — INDOOR A61AC-A
ARI RATED COOLING CAP.: BTUH(95) 44000, SEER[1.30]
ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPF 7.60 MIN.DHR REQ IV
BTUH (17) 25000, COP(17) 2.20
FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 X AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
40,000				
	.05	$ 462	1010	
	.06	$ 558	1213	
	.07	$ 648	1416	
	.08	$ 739	1619	
	.09	$ 836	1822	
	.10	$ 925	2025	
	.12	$ 1111	2431	
	.14	$ 1297	2838	BALANCE POINT 16 DEG.F.
	.16	$ 1484	3244	
50,000				
	.05	$ 581	1263	
	.06	$ 705	1517	
	.07	$ 818	1771	
	.08	$ 936	2025	
	.09	$ 1049	2279	
	.10	$ 1173	2533	
	.12	$ 1405	3041	
	.14	$ 1642	3549	BALANCE POINT 23 DEG.F.
	.16	$ 1873	4057	
60,000				
	.05	$ 727	1517	
	.06	$ 868	1822	
	.07	$ 1015	2127	
	.08	$ 1163	2431	
	.09	$ 1309	2736	
	.10	$ 1450	3041	
	.12	$ 1737	3650	
	.14	$ 2031	4260	BALANCE POINT 28 DEG.F.
	.16	$ 2319	4869	
70,000				
	.05	$ 885	1771	
	.06	$ 1060	2127	
	.07	$ 1235	2482	
	.08	$ 1410	2838	
	.09	$ 1591	3193	
	.10	$ 1766	3549	
	.12	$ 2115	4260	
	.14	$ 2477	4971	BALANCE POINT 32 DEG.F.
	.16	$ 2826	5682	
80,000				
	.05	$ 1066	2025	
	.06	$ 1275	2431	
	.07	$ 1495	2838	
	.08	$ 1704	3244	
	.09	$ 1918	3650	
	.10	$ 2127	4057	
	.12	$ 2561	4869	
	.14	$ 2984	5682	BALANCE POINT 35 DEG.F.
	.16	$ 3413	6494	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	155	186	218	249	280	311	373	436	498	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 42UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 42UHPQA INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 44000, SEER( ) 10.

ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPF 7.60 MIN.DHR REG IV

BTUH (17) 25000, COP(17) 2.20

FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
40,000		$ 310	349	394	440	485	530	575	620	665	705	795	885	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 417	423	428	434	440	445	451	457	451	462	473	485	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 490	496	502	507	513	519	524	530	530	536	547	558	
	.07	$ 569	575	581	586	592	598	603	609	609	615	626	637	
	.08	$ 648	654	660	665	671	677	682	688	688	694	705	716	
	.09	$ 722	727	733	739	744	750	756	761	761	767	778	789	
	.10	$ 801	806	813	818	823	829	835	840	840	846	857	868	
	.12	$ 953	959	964	970	976	981	987	993	993	998	1010	1021	BALANCE POINT 16 DEG.F.
	.14	$ 1105	1111	1117	1122	1128	1134	1139	1145	1145	1151	1162	1173	
	.16	$ 1258	1263	1269	1275	1280	1286	1292	1297	1297	1303	1314	1326	
50,000		$ 383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 479	490	507	524	541	558	569	586	603	620	648	682	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 552	564	581	598	615	631	643	660	677	694	722	756	
	.07	$ 626	637	654	671	688	705	716	733	750	767	795	829	
	.08	$ 705	716	733	750	767	784	795	812	829	846	874	908	
	.09	$ 778	789	806	823	840	857	868	885	902	919	947	981	
	.10	$ 852	863	880	897	914	931	942	959	976	993	1021	1055	
	.12	$ 998	1010	1026	1043	1060	1077	1089	1105	1122	1139	1168	1201	BALANCE POINT 23 DEG.F.
	.14	$ 1145	1156	1173	1190	1207	1224	1235	1252	1269	1286	1314	1348	
	.16	$ 1292	1303	1320	1337	1354	1371	1382	1399	1416	1433	1461	1495	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 541	569	598	626	654	682	710	739	767	795	852	908	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 609	637	665	694	722	750	778	806	835	863	919	976	
	.07	$ 677	705	733	761	789	818	846	874	902	931	987	1043	
	.08	$ 744	773	801	829	857	885	914	942	970	998	1055	1111	
	.09	$ 812	840	868	897	925	953	981	1010	1038	1066	1123	1179	
	.10	$ 880	914	942	970	998	1026	1055	1083	1111	1139	1196	1252	
	.12	$ 1021	1049	1077	1105	1134	1162	1190	1218	1247	1275	1331	1388	BALANCE POINT 28 DEG.F.
	.14	$ 1156	1184	1213	1241	1269	1297	1326	1354	1382	1410	1467	1523	
	.16	$ 1297	1326	1354	1382	1410	1438	1467	1495	1523	1551	1608	1664	
70,000		$ 541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 598	643	688	733	778	829	874	919	964	1015	1105	1196	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 648	694	739	784	829	880	925	970	1015	1066	1156	1247	
	.07	$ 705	750	795	840	885	936	981	1026	1072	1122	1213	1303	
	.08	$ 756	801	846	891	936	987	1032	1077	1122	1173	1263	1354	
	.09	$ 812	857	902	947	993	1043	1089	1134	1179	1230	1320	1410	
	.10	$ 863	908	953	998	1043	1094	1139	1184	1230	1280	1371	1461	
	.12	$ 970	1015	1060	1105	1151	1201	1247	1292	1337	1388	1478	1568	BALANCE POINT 32 DEG.F.
	.14	$ 1077	1122	1168	1213	1258	1309	1354	1399	1444	1495	1585	1675	
	.16	$ 1184	1230	1275	1320	1365	1416	1461	1506	1551	1602	1692	1783	
80,000		$ 620	705	795	885	976	1060	1151	1241	1331	1416	1596	1771	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 671	722	778	829	880	936	987	1043	1094	1145	1252	1359	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 733	784	840	891	942	998	1049	1105	1156	1207	1314	1421	
	.07	$ 789	840	897	947	998	1055	1105	1162	1213	1263	1371	1478	
	.08	$ 852	902	959	1010	1060	1117	1168	1224	1275	1326	1433	1540	
	.09	$ 914	964	1021	1072	1122	1179	1230	1286	1337	1388	1495	1602	
	.10	$ 970	1027	1077	1128	1179	1235	1286	1342	1393	1444	1551	1658	
	.12	$ 1094	1145	1201	1252	1303	1359	1410	1467	1517	1568	1675	1783	BALANCE POINT 35 DEG.F.
	.14	$ 1213	1263	1320	1371	1421	1478	1529	1585	1636	1687	1794	1901	
	.16	$ 1331	1382	1438	1489	1540	1596	1647	1704	1754	1805	1912	2020	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	155	186	218	249	280	311	373	436	498	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 42UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 42UHPQA — INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 44000, SEER11.30

ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPF 7.60 MIN.DHR REG IV

BTUH (17) 25000 COP(17) 2.20

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
40,000		$ 445	507	575	637	699	767	829	891	959	1021	1083	1151	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 434	440	451	457	462	468	479	485	490	502	507	513	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 507	513	524	530	536	541	552	558	564	575	581	586	
	.07	$ 580	592	603	609	615	620	631	637	643	654	660	665	
	.08	$ 665	677	682	688	694	699	710	716	722	733	739	744	
	.09	$ 739	744	756	761	767	773	784	789	795	806	812	818	
	.10	$ 818	833	835	840	846	852	863	868	874	885	891	897	
	.12	$ 910	916	987	993	998	1004	1015	1021	1026	1038	1043	1049	
	.14	$ 1122	1128	1139	1145	1151	1156	1168	1173	1179	1190	1196	1201	BALANCE POINT 16 DEG.F.
	.16	$ 1275	1280	1292	1297	1303	1309	1320	1326	1331	1342	1348	1354	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 524	547	569	592	615	637	665	688	710	733	756	778	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 598	620	643	665	688	710	739	761	784	806	829	852	
	.07	$ 671	694	716	739	761	784	812	835	857	880	903	925	
	.08	$ 750	773	795	818	840	863	891	914	936	959	981	1004	
	.09	$ 823	846	868	891	914	936	964	987	1010	1032	1055	1077	
	.10	$ 897	919	942	964	987	1010	1038	1060	1083	1105	1128	1151	
	.12	$ 1043	1066	1089	1111	1134	1156	1184	1207	1230	1252	1275	1297	
	.14	$ 1190	1213	1235	1258	1280	1303	1331	1354	1376	1399	1421	1444	BALANCE POINT 23 DEG.F.
	.16	$ 1337	1359	1382	1405	1427	1450	1478	1500	1523	1546	1568	1591	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 626	671	710	750	789	829	874	914	953	993	1032	1077	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 694	739	778	818	857	897	942	981	1021	1060	1100	1145	
	.07	$ 761	806	846	886	925	964	1010	1049	1089	1128	1168	1213	
	.08	$ 829	874	914	953	993	1032	1077	1117	1156	1196	1235	1280	
	.09	$ 897	942	981	1021	1060	1100	1145	1184	1224	1263	1303	1348	
	.10	$ 970	1015	1055	1094	1134	1173	1218	1258	1297	1337	1376	1421	
	.12	$ 1105	1151	1190	1230	1269	1309	1354	1393	1433	1473	1514	1557	
	.14	$ 1241	1286	1326	1365	1405	1444	1489	1529	1568	1608	1647	1692	BALANCE POINT 28 DEG.F.
	.16	$ 1382	1427	1467	1506	1546	1585	1630	1670	1709	1749	1788	1833	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 739	806	874	942	1004	1072	1139	1207	1275	1342	1410	1472	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 789	857	925	993	1055	1122	1190	1258	1326	1393	1461	1523	
	.07	$ 846	914	981	1049	1111	1179	1247	1314	1382	1450	1517	1579	
	.08	$ 897	964	1032	1100	1162	1230	1297	1365	1433	1500	1568	1630	
	.09	$ 953	1021	1089	1156	1218	1286	1354	1421	1489	1557	1625	1687	
	.10	$ 1004	1072	1139	1207	1269	1337	1405	1472	1540	1608	1675	1737	
	.12	$ 1111	1179	1247	1314	1376	1444	1512	1579	1647	1715	1783	1845	
	.14	$ 1218	1286	1354	1421	1484	1551	1619	1687	1754	1822	1890	1952	BALANCE POINT 32 DEG.F.
	.16	$ 1326	1393	1461	1529	1591	1658	1726	1794	1862	1929	1997	2059	
80,000		$ 891	1021	1151	1280	1405	1534	1664	1788	1918	2048	2172	2302	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 835	908	987	1060	1139	1218	1292	1371	1444	1523	1596	1675	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 897	970	1049	1122	1201	1280	1354	1433	1506	1585	1658	1737	
	.07	$ 953	1026	1105	1179	1258	1337	1410	1489	1563	1642	1715	1794	
	.08	$ 1015	1089	1168	1241	1320	1399	1472	1551	1625	1704	1777	1856	
	.09	$ 1072	1151	1230	1302	1381	1461	1534	1613	1687	1766	1839	1918	
	.10	$ 1134	1207	1286	1359	1438	1517	1591	1670	1743	1822	1895	1974	
	.12	$ 1258	1331	1410	1484	1563	1642	1715	1794	1867	1946	2020	2099	
	.14	$ 1376	1450	1529	1602	1681	1760	1833	1912	1986	2065	2138	2217	BALANCE POINT 35 DEG.F.
	.16	$ 1495	1568	1647	1721	1799	1878	1952	2031	2104	2183	2257	2336	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	155	186	218	249	280	311	373	436	498	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 42UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 42UHPQA — INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 49000, SEER11.39

ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPF 7.60 MIN.DHR REG IV

BTUH (17) 25000, COP(17) 2.20

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
40,000		$ 581	631	682	727	778	829	874	925	976	1072	1168	1168	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 451	457	462	468	473	479	485	490	496	507	519	519	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 524	530	536	541	547	552	558	564	569	581	592	592	
	.07	$ 603	609	615	620	626	631	637	643	648	660	671	671	
	.08	$ 682	688	694	699	705	710	716	722	727	739	750	750	
	.09	$ 756	761	767	773	778	784	789	795	801	812	823	823	
	.10	$ 835	840	846	852	857	863	868	874	880	891	902	902	
	.12	$ 987	993	998	1004	1010	1015	1021	1026	1032	1043	1055	1055	
	.14	$ 1139	1145	1151	1156	1162	1168	1173	1179	1184	1196	1207	1207	BALANCE POINT 16 DEG.F.
	.16	$ 1292	1297	1303	1309	1314	1320	1326	1331	1337	1348	1359	1359	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 575	592	609	626	643	660	677	699	716	750	784	784	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 648	665	682	699	716	733	750	773	789	823	857	857	
	.07	$ 722	739	756	773	789	806	823	846	863	897	931	931	
	.08	$ 801	818	835	852	868	885	902	925	942	976	1010	1010	
	.09	$ 874	891	908	925	942	959	976	998	1015	1049	1083	1083	
	.10	$ 947	964	981	998	1015	1032	1049	1072	1089	1122	1156	1156	
	.12	$ 1094	1111	1128	1145	1162	1179	1196	1218	1235	1269	1303	1303	BALANCE POINT 23 DEG.F.
	.14	$ 1241	1258	1275	1292	1309	1326	1342	1365	1382	1416	1450	1450	
	.16	$ 1388	1405	1421	1438	1455	1472	1489	1512	1529	1563	1596	1596	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 716	744	778	806	840	868	902	931	964	1026	1089	1089	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 784	812	846	874	908	936	970	998	1032	1094	1156	1156	
	.07	$ 852	880	914	942	976	1004	1038	1066	1100	1162	1224	1224	
	.08	$ 919	947	981	1010	1043	1072	1105	1134	1168	1230	1292	1292	
	.09	$ 987	1015	1049	1077	1111	1139	1173	1201	1235	1297	1359	1359	
	.10	$ 1060	1089	1122	1151	1184	1213	1247	1275	1309	1371	1433	1433	
	.12	$ 1198	1224	1258	1286	1320	1348	1382	1410	1444	1506	1568	1568	BALANCE POINT 28 DEG.F.
	.14	$ 1351	1359	1393	1421	1455	1484	1517	1546	1579	1642	1704	1704	
	.16	$ 1472	1500	1534	1563	1596	1625	1658	1687	1721	1783	1845	1845	
70,000		$ 1021	1105	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 880	931	981	1038	1089	1139	1190	1241	1292	1393	1495	1495	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 931	981	1032	1089	1139	1190	1241	1292	1343	1444	1546	1546	
	.07	$ 987	1038	1089	1145	1196	1247	1297	1348	1399	1500	1602	1602	
	.08	$ 1038	1089	1139	1196	1247	1297	1348	1399	1450	1551	1653	1653	
	.09	$ 1094	1145	1196	1252	1303	1354	1405	1455	1506	1608	1709	1709	
	.10	$ 1145	1196	1247	1303	1354	1405	1455	1506	1557	1658	1760	1760	
	.12	$ 1252	1303	1354	1410	1461	1512	1563	1613	1664	1766	1867	1867	BALANCE POINT 32 DEG.F.
	.14	$ 1359	1410	1461	1517	1568	1619	1670	1721	1771	1873	1974	1974	
	.16	$ 1467	1517	1568	1625	1675	1726	1777	1828	1878	1980	2082	2082	
80,000		$ 1168	1263	1365	1461	1557	1658	1754	1850	1952	2144	2341	2341	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 998	1055	1117	1173	1230	1292	1348	1405	1461	1579	1698	1698	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1060	1117	1179	1235	1292	1354	1410	1467	1523	1642	1760	1760	
	.07	$ 1117	1173	1235	1292	1348	1410	1467	1523	1579	1698	1816	1816	
	.08	$ 1179	1235	1297	1354	1410	1472	1529	1585	1642	1760	1878	1878	
	.09	$ 1241	1297	1359	1416	1472	1534	1591	1647	1704	1822	1941	1941	
	.10	$ 1297	1354	1416	1472	1529	1591	1647	1704	1760	1878	1997	1997	
	.12	$ 1421	1478	1540	1596	1653	1715	1771	1828	1884	2003	2121	2121	
	.14	$ 1540	1596	1658	1715	1771	1833	1890	1946	2003	2121	2240	2240	BALANCE POINT 35 DEG.F.
	.16	$ 1658	1715	1777	1833	1890	1952	2008	2065	2121	2240	2358	2358	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	155	186	218	249	280	311	373	436	498	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 48UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 48UHPQA INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 58000, SEER 10.50
ARI RATED HEATING CAP.: BTUH (47) 48000, COP(47) 3.20, HSPF 7.40 MIN.DHR REQ IV
BTUH (17) 29000, COP(17) 2.10
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. ENERG. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
60,000				
	.05	$ 739	1517	
	.06	885	1822	
	.07	1032	2127	
	.08	1184	2431	
	.09	1331	2736	
	.10	1478	3041	
	.12	1773	3650	
	.14	2070	4260	BALANCE POINT 24 DEG.F.
	.16	2364	4869	
70,000				
	.05	$ 885	1771	
	.06	1066	2127	
	.07	1241	2482	
	.08	1416	2838	
	.09	1596	3193	
	.10	1771	3549	
	.12	2121	4260	
	.14	2477	4971	BALANCE POINT 28 DEG.F.
	.16	2832	5682	
80,000				
	.05	$ 1043	2025	
	.06	1253	2431	
	.07	1467	2838	
	.08	1670	3244	
	.09	1878	3650	
	.10	2093	4057	
	.12	2510	4869	
	.14	2922	5682	BALANCE POINT 32 DEG.F.
	.16	3346	6494	
90,000				
	.05	$ 1230	2279	
	.06	1472	2736	
	.07	1721	3193	
	.08	1969	3650	
	.09	2211	4107	
	.10	2460	4564	
	.12	2956	5478	
	.14	3442	6393	BALANCE POINT 35 DEG.F.
	.16	3938	7307	
100,000				
	.05	$ 1421	2533	
	.06	1704	3041	
	.07	1991	3549	
	.08	2273	4057	
	.09	2561	4564	
	.10	2843	5072	
	.12	3408	6088	
	.14	3978	7104	BALANCE POINT 37 DEG.F.
	.16	4547	8119	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	190	228	266	304	342	380	457	533	609	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 48UEPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 48UEPQA — INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH (95) 50000, SEER 10.50
ARI RATED HEATING CAP.: BTUH (47) 48000, COP (47) 3.20, HSPF 7.40 MIN.DHR REG IV
BTUH (17) 29000, COP (17) 2.10
FURNACE TYPE NATURAL GAS — FURNACE EFFICIENCY 78.00 % AFUE

NATURAL GAS COST - $/THERM

HEAT LOSS BTUH	ELEC. COST $/KWH		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
50,000		$	383	440	496	552	609	665	716	773	829	885	998	1105	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	530	541	547	558	569	581	592	603	609	620	643	665	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	620	631	637	648	660	671	682	694	699	710	733	756	
	.07	$	716	727	733	744	756	767	778	789	795	806	829	852	
	.08	$	806	818	823	835	846	857	868	880	885	897	919	942	
	.09	$	897	908	914	925	936	947	959	970	976	987	1010	1032	
	.10	$	987	998	1004	1015	1026	1038	1049	1060	1066	1077	1100	1123	
	.12	$	1173	1184	1190	1201	1213	1221	1235	1247	1252	1263	1286	1309	BALANCE POINT 18 DEG.F.
	.14	$	1354	1365	1371	1382	1393	1405	1416	1427	1433	1444	1467	1489	
	.16	$	1534	1546	1551	1563	1574	1585	1596	1608	1613	1625	1647	1670	
60,000		$	462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	603	620	637	660	677	694	716	733	750	773	812	846	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	694	710	727	750	767	784	806	823	840	863	902	936	
	.07	$	789	806	823	846	863	880	902	919	936	959	998	1032	
	.08	$	880	897	914	936	953	970	993	1010	1026	1049	1089	1122	
	.09	$	976	993	1010	1032	1049	1066	1089	1105	1122	1145	1184	1218	
	.10	$	1066	1083	1100	1122	1139	1156	1179	1196	1213	1235	1275	1309	
	.12	$	1252	1269	1286	1309	1326	1342	1365	1382	1399	1421	1461	1495	BALANCE POINT 24 DEG.F.
	.14	$	1438	1455	1472	1495	1512	1529	1551	1568	1585	1608	1647	1681	
	.16	$	1625	1642	1658	1681	1698	1715	1737	1754	1771	1794	1833	1867	
70,000		$	541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	654	688	716	750	784	818	852	885	914	947	1015	1083	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	739	773	801	835	868	902	936	970	998	1032	1100	1168	
	.07	$	823	857	885	919	953	987	1021	1055	1083	1117	1184	1252	
	.08	$	908	942	970	1004	1038	1072	1105	1139	1168	1201	1269	1337	
	.09	$	993	1026	1055	1089	1122	1156	1190	1224	1252	1286	1354	1421	
	.10	$	1083	1117	1145	1179	1213	1247	1280	1314	1342	1376	1444	1512	
	.12	$	1252	1286	1314	1348	1382	1416	1450	1484	1511	1546	1613	1681	BALANCE POINT 28 DEG.F.
	.14	$	1421	1455	1484	1517	1551	1585	1619	1653	1681	1715	1783	1850	
	.16	$	1591	1625	1653	1687	1721	1754	1788	1822	1850	1884	1952	2020	
80,000		$	620	705	795	885	976	1060	1151	1241	1331	1416	1596	1771	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	699	750	806	857	908	964	1015	1072	1122	1173	1280	1388	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	767	818	874	925	976	1032	1083	1139	1190	1241	1348	1455	
	.07	$	829	880	936	987	1038	1094	1145	1201	1252	1300	1410	1517	
	.08	$	897	947	1004	1055	1105	1162	1213	1269	1320	1371	1478	1585	
	.09	$	959	1010	1066	1117	1168	1224	1275	1331	1382	1433	1540	1647	
	.10	$	1026	1077	1134	1184	1235	1292	1342	1399	1450	1500	1608	1715	
	.12	$	1156	1207	1263	1314	1365	1421	1472	1529	1579	1630	1737	1845	BALANCE POINT 32 DEG.F.
	.14	$	1286	1337	1393	1444	1495	1551	1602	1658	1709	1760	1867	1974	
	.16	$	1416	1467	1523	1574	1625	1681	1732	1788	1839	1890	1997	2104	
90,000		$	694	795	897	998	1094	1196	1297	1393	1495	1596	1794	1997	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	778	840	897	959	1015	1077	1134	1196	1258	1314	1433	1551	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	852	914	970	1032	1089	1151	1207	1269	1331	1388	1506	1625	
	.07	$	925	987	1043	1105	1162	1224	1280	1342	1405	1461	1579	1698	
	.08	$	993	1055	1111	1173	1230	1292	1348	1410	1472	1529	1647	1766	
	.09	$	1066	1128	1184	1247	1303	1365	1421	1484	1546	1602	1721	1839	
	.10	$	1139	1201	1258	1320	1376	1439	1495	1557	1619	1675	1794	1912	
	.12	$	1286	1348	1405	1467	1523	1585	1642	1704	1766	1822	1941	2059	BALANCE POINT 35 DEG.F.
	.14	$	1427	1489	1546	1608	1664	1726	1783	1845	1907	1963	2082	2200	
	.16	$	1574	1636	1692	1754	1811	1873	1979	1991	2053	2110	2228	2347	
100,000		$	773	885	998	1105	1218	1331	1438	1551	1664	1771	1997	2217	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$	829	908	987	1072	1151	1230	1309	1393	1472	1551	1715	1873	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	880	959	1038	1122	1201	1280	1359	1444	1523	1602	1766	1924	
	.07	$	931	1010	1089	1173	1252	1331	1410	1495	1574	1653	1816	1974	
	.08	$	987	1066	1145	1230	1309	1388	1467	1551	1630	1709	1873	2031	
	.09	$	1038	1117	1196	1280	1359	1438	1517	1602	1681	1760	1924	2082	
	.10	$	1089	1168	1247	1331	1410	1489	1568	1653	1732	1811	1974	2132	
	.12	$	1196	1275	1354	1438	1517	1596	1675	1760	1839	1918	2082	2240	BALANCE POINT 37 DEG.F.
	.14	$	1303	1382	1461	1546	1625	1704	1783	1867	1946	2025	2189	2347	
	.16	$	1410	1489	1568	1653	1732	1811	1890	1974	2053	2132	2296	2454	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 48UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 48UHPQA INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 52000, SEER10.50
ARI RATED HEATING CAP.: BTUH (47) 48000, COP(47) 3.20, HSPF 7.40 MIN.OHR REG IV
BTUH (17) 29000, COP(17) 2.10
FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
50,000		$ 558	637	716	795	880	959	1038	1117	1196	1280	1359	1438	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 558	575	592	603	620	637	648	665	682	694	710	722	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 648	665	682	694	710	727	739	756	773	784	801	812	
	.07	$ 744	761	778	789	806	823	835	852	868	880	897	908	
	.08	$ 835	852	868	880	897	914	925	942	959	970	987	998	
	.09	$ 925	942	959	970	987	1004	1015	1032	1049	1060	1077	1089	
	.10	$ 1015	1032	1049	1060	1077	1094	1105	1122	1139	1151	1168	1179	
	.12	$ 1201	1218	1235	1247	1263	1280	1292	1309	1326	1337	1354	1365	BALANCE POINT 18 DEG.F.
	.14	$ 1382	1399	1416	1427	1444	1461	1473	1489	1506	1517	1534	1546	
	.16	$ 1563	1579	1596	1608	1625	1642	1653	1670	1687	1698	1715	1726	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 660	688	716	739	767	795	823	852	880	908	931	959	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 750	778	806	829	857	885	914	942	970	998	1021	1049	
	.07	$ 846	874	902	925	953	981	1010	1038	1066	1094	1117	1145	
	.08	$ 936	964	993	1015	1043	1072	1100	1128	1156	1184	1207	1235	
	.09	$ 1032	1060	1089	1111	1139	1168	1196	1224	1252	1280	1303	1331	
	.10	$ 1122	1151	1179	1201	1230	1258	1286	1314	1342	1371	1393	1421	
	.12	$ 1309	1337	1365	1388	1416	1444	1473	1500	1529	1557	1579	1608	BALANCE POINT 24 DEG.F.
	.14	$ 1496	1523	1551	1574	1602	1630	1658	1687	1715	1743	1766	1794	
	.16	$ 1681	1709	1737	1760	1788	1816	1845	1873	1901	1929	1952	1980	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 756	801	852	897	942	993	1038	1089	1134	1179	1230	1275	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 840	885	936	981	1026	1077	1122	1173	1218	1263	1314	1359	
	.07	$ 925	970	1021	1066	1111	1162	1207	1258	1303	1348	1399	1444	
	.08	$ 1010	1055	1105	1151	1196	1247	1292	1342	1388	1433	1484	1529	
	.09	$ 1094	1139	1190	1235	1280	1331	1376	1427	1472	1517	1568	1613	
	.10	$ 1184	1230	1280	1326	1371	1421	1467	1517	1563	1608	1658	1704	
	.12	$ 1351	1399	1450	1495	1540	1591	1636	1687	1732	1777	1828	1873	BALANCE POINT 28 DEG.F.
	.14	$ 1523	1568	1619	1664	1709	1760	1805	1856	1901	1946	1997	2042	
	.16	$ 1692	1737	1789	1833	1878	1929	1974	2025	2070	2115	2166	2211	
80,000		$ 891	1011	1161	1280	1405	1534	1664	1788	1918	2048	2172	2302	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 863	936	1015	1089	1168	1247	1320	1399	1472	1551	1625	1704	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 901	1004	1083	1156	1235	1314	1388	1467	1540	1619	1692	1771	
	.07	$ 993	1096	1145	1218	1297	1376	1450	1529	1602	1681	1754	1833	
	.08	$ 1060	1114	1213	1286	1365	1444	1517	1596	1670	1749	1822	1901	
	.09	$ 1122	1196	1275	1348	1427	1506	1579	1658	1732	1811	1884	1963	
	.10	$ 1190	1263	1342	1416	1495	1574	1647	1726	1799	1878	1952	2031	
	.12	$ 1320	1393	1472	1546	1625	1704	1777	1856	1929	2008	2082	2161	BALANCE POINT 32 DEG.F.
	.14	$ 1450	1523	1602	1675	1754	1833	1907	1986	2059	2138	2211	2290	
	.16	$ 1579	1653	1732	1805	1884	1963	2036	2115	2189	2268	2341	2420	
90,000		$ 1004	1151	1292	1438	1579	1726	1873	2014	2161	2302	2448	2589	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 964	1048	1134	1218	1309	1393	1478	1563	1653	1737	1822	1907	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1008	1123	1207	1292	1382	1467	1551	1636	1726	1811	1895	1980	
	.07	$ 1111	1196	1280	1365	1455	1540	1625	1709	1799	1884	1969	2053	
	.08	$ 1179	1263	1348	1433	1523	1608	1692	1777	1867	1952	2036	2121	
	.09	$ 1253	1337	1421	1506	1596	1681	1766	1850	1941	2025	2110	2194	
	.10	$ 1326	1410	1495	1579	1670	1754	1839	1924	2014	2099	2183	2268	
	.12	$ 1471	1557	1642	1726	1816	1901	1986	2070	2161	2245	2330	2415	BALANCE POINT 35 DEG.F.
	.14	$ 1615	1698	1783	1867	1957	2042	2127	2211	2302	2386	2471	2556	
	.16	$ 1760	1845	1929	2014	2104	2189	2273	2358	2448	2533	2618	2702	
100,000		$ 1117	1280	1438	1596	1760	1918	2076	2240	2398	2561	2719	2877	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1077	1190	1309	1427	1540	1658	1771	1890	2003	2121	2234	2352	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1128	1241	1359	1478	1591	1709	1822	1941	2053	2172	2285	2403	
	.07	$ 1179	1292	1410	1529	1642	1760	1873	1991	2104	2223	2336	2454	
	.08	$ 1236	1348	1467	1585	1698	1816	1929	2048	2161	2279	2393	2510	
	.09	$ 1288	1399	1517	1636	1749	1867	1980	2099	2211	2330	2443	2561	
	.10	$ 1337	1450	1568	1687	1799	1918	2031	2149	2262	2381	2494	2612	
	.12	$ 1444	1557	1675	1794	1907	2025	2138	2257	2369	2488	2601	2719	BALANCE POINT 37 DEG.F.
	.14	$ 1551	1664	1783	1901	2014	2132	2245	2364	2477	2595	2708	2826	
	.16	$ 1658	1771	1890	2008	2121	2240	2352	2471	2584	2702	2815	2934	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 48UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 48UHPQA INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 50000, SEER(10.50)

ARI RATED HEATING CAP.: BTUH (47) 38000, COP(47) 3.20, HSPF 7.40 MIN.OHR REG IV

BTUH (17) 29000, COP(17) 2.10

FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
50,000		$ 727	789	852	914	976	1032	1094	1156	1218	1337	1461	1461	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 592	603	615	626	637	648	660	671	682	705	727	727	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 682	694	705	716	727	739	750	761	773	795	818	818	
	.07	$ 778	789	801	812	823	835	846	857	868	891	914	914	
	.08	$ 868	880	891	902	914	925	936	947	959	981	1004	1004	
	.09	$ 959	970	981	993	1004	1015	1026	1038	1049	1072	1094	1094	
	.10	$ 1049	1060	1072	1083	1094	1105	1117	1128	1139	1162	1184	1184	
	.12	$ 1136	1247	1258	1269	1280	1291	1303	1314	1326	1348	1371	1371	BALANCE POINT 18 DEG.F.
	.14	$ 1416	1427	1438	1450	1461	1472	1484	1495	1506	1529	1551	1551	
	.16	$ 1596	1608	1619	1630	1642	1653	1664	1675	1687	1709	1732	1732	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 716	739	761	778	801	823	846	863	885	925	970	970	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 806	829	852	868	891	914	936	953	976	1015	1060	1060	
	.07	$ 902	925	947	964	987	1010	1032	1049	1072	1111	1156	1156	
	.08	$ 993	1015	1038	1055	1077	1100	1122	1139	1162	1201	1247	1247	
	.09	$ 1089	1111	1134	1151	1173	1196	1218	1235	1258	1297	1342	1342	
	.10	$ 1179	1201	1224	1241	1263	1286	1309	1326	1348	1388	1433	1433	
	.12	$ 1365	1388	1410	1427	1450	1472	1496	1512	1534	1574	1619	1619	BALANCE POINT 24 DEG.F.
	.14	$ 1551	1574	1596	1613	1636	1658	1681	1698	1721	1760	1805	1805	
	.16	$ 1737	1760	1783	1799	1822	1845	1867	1884	1907	1946	1991	1991	
70,000		$ 1021	1105	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 857	891	931	964	998	1038	1072	1111	1145	1218	1292	1292	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 942	976	1015	1049	1083	1122	1156	1196	1230	1303	1376	1376	
	.07	$ 1026	1060	1100	1134	1168	1207	1241	1280	1314	1388	1461	1461	
	.08	$ 1111	1145	1184	1218	1252	1291	1326	1365	1399	1472	1546	1546	
	.09	$ 1196	1230	1269	1303	1337	1376	1410	1450	1484	1557	1630	1630	
	.10	$ 1286	1320	1359	1393	1427	1467	1500	1540	1574	1647	1721	1721	
	.12	$ 1455	1489	1528	1563	1596	1636	1670	1709	1743	1816	1890	1890	BALANCE POINT 28 DEG.F.
	.14	$ 1625	1658	1698	1732	1766	1805	1839	1878	1912	1986	2059	2059	
	.16	$ 1794	1828	1867	1901	1935	1974	2008	2048	2082	2155	2228	2228	
80,000		$ 1168	1263	1365	1461	1557	1658	1754	1850	1952	2144	2341	2341	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1026	1083	1145	1201	1258	1320	1376	1433	1489	1608	1726	1726	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1094	1151	1213	1269	1326	1388	1444	1500	1557	1675	1794	1794	
	.07	$ 1156	1213	1275	1331	1388	1450	1506	1563	1619	1737	1856	1856	
	.08	$ 1224	1280	1342	1399	1455	1517	1573	1630	1687	1805	1924	1924	
	.09	$ 1286	1342	1405	1461	1517	1579	1636	1692	1749	1867	1986	1986	
	.10	$ 1354	1410	1472	1529	1585	1647	1704	1760	1816	1936	2053	2053	
	.12	$ 1484	1540	1602	1658	1715	1777	1833	1890	1946	2065	2183	2183	BALANCE POINT 32 DEG.F.
	.14	$ 1613	1670	1733	1788	1845	1907	1963	2020	2076	2194	2313	2313	
	.16	$ 1743	1799	1862	1918	1974	2036	2093	2149	2206	2324	2443	2443	
90,000		$ 1314	1427	1534	1642	1754	1862	1974	2082	2194	2415	2635	2635	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1145	1213	1280	1342	1410	1472	1540	1608	1670	1805	1935	1935	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1218	1286	1354	1416	1484	1546	1613	1681	1743	1878	2008	2008	
	.07	$ 1292	1359	1427	1489	1557	1619	1687	1754	1816	1952	2082	2082	
	.08	$ 1359	1427	1495	1557	1625	1687	1754	1823	1884	2020	2149	2149	
	.09	$ 1433	1500	1568	1630	1698	1760	1828	1895	1957	2093	2223	2223	
	.10	$ 1500	1574	1641	1704	1771	1833	1901	1969	2031	2166	2296	2296	
	.12	$ 1653	1721	1788	1850	1918	1980	2048	2116	2178	2313	2443	2443	BALANCE POINT 35 DEG.F.
	.14	$ 1794	1862	1929	1991	2059	2121	2189	2257	2319	2454	2584	2584	
	.16	$ 1941	2008	2076	2138	2206	2268	2336	2403	2465	2601	2731	2731	
100,000		$ 1461	1585	1704	1828	1952	2070	2194	2313	2437	2680	2928	2928	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1316	1416	1500	1591	1681	1766	1856	1946	2031	2211	2386	2386	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1376	1467	1551	1642	1732	1818	1907	1997	2082	2262	2437	2437	
	.07	$ 1427	1517	1602	1692	1783	1867	1957	2048	2133	2313	2488	2488	
	.08	$ 1484	1574	1658	1749	1839	1924	2014	2104	2189	2369	2544	2544	
	.09	$ 1534	1625	1709	1799	1890	1974	2065	2155	2240	2420	2595	2595	
	.10	$ 1585	1675	1760	1850	1941	2025	2115	2206	2290	2471	2646	2646	
	.12	$ 1692	1783	1867	1957	2048	2132	2223	2313	2398	2578	2753	2753	BALANCE POINT 37 DEG.F.
	.14	$ 1799	1890	1974	2065	2155	2240	2330	2420	2505	2685	2860	2860	
	.16	$ 1907	1997	2082	2172	2262	2347	2437	2527	2612	2793	2968	2968	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 6OUHPOA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 6OUHPOA — INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70

ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, HSPF 7.50 MIN.DHR REC IV
BTUH (17) 35500, COP(17) 2.20

FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
80,000				
	.05 $	959	2025	
	.06 $	1145	2431	
	.07 $	1337	2838	
	.08 $	1529	3244	
	.09 $	1721	3650	
	.10 $	1912	4057	
	.12 $	2296	4869	
	.14 $	2680	5682	BALANCE POINT 25 DEG.F.
	.16 $	3058	6494	
90,000				
	.05 $	1100	2279	
	.06 $	1326	2736	
	.07 $	1546	3193	
	.08 $	1766	3650	
	.09 $	1986	4107	
	.10 $	2206	4564	
	.12 $	2646	5478	
	.14 $	3092	6393	BALANCE POINT 28 DEG.F.
	.16 $	3526	7307	
100,000				
	.05 $	1358	2533	
	.06 $	1506	3041	
	.07 $	1766	3549	
	.08 $	2014	4057	
	.09 $	2268	4564	
	.10 $	2516	5072	
	.12 $	3018	6088	
	.14 $	3521	7104	BALANCE POINT 31 DEG.F.
	.16 $	4023	8119	
110,000				
	.05 $	1433	2787	
	.06 $	1721	3346	
	.07 $	2008	3904	
	.08 $	2290	4463	
	.09 $	2578	5021	
	.10 $	2872	5580	
	.12 $	3447	6697	
	.14 $	4017	7815	BALANCE POINT 33 DEG.F.
	.16 $	4593	8932	
130,000				
	.05 $	1805	3295	
	.06 $	2166	3955	
	.07 $	2527	4615	
	.08 $	2889	5275	
	.09 $	3250	5936	
	.10 $	3611	6596	
	.12 $	4333	7916	
	.14 $	5055	9236	BALANCE POINT 37 DEG.F.
	.16 $	5778	10557	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	216	260	303	346	390	433	520	607	693	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 60UHPOA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 60UHPOA INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95°) 58000, SEER 10.70

ARI RATED HEATING CAP.: BTUH (47°) 61000, COP(47°) 3.20, HSPF 7.50 MIN.DSR RBU IV

BTUH (17°) 35500, COP(17°) 2.20

FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	NATURAL GAS COST - $/THERM .35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
60,000		$ 462	530	598	665	727	795	863	931	998	1060	1196	1331	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 609	626	637	648	660	671	688	699	710	722	750	773	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 710	727	739	750	761	773	789	801	812	823	852	874	
	.07	$ 818	835	846	857	869	880	897	908	919	931	959	981	
	.08	$ 919	936	947	959	970	981	998	1010	1021	1032	1060	1080	
	.09	$ 1026	1043	1055	1066	1077	1089	1105	1117	1128	1139	1168	1190	
	.10	$ 1138	1145	1156	1168	1179	1190	1207	1218	1230	1241	1269	1292	
	.12	$ 1337	1354	1365	1376	1388	1399	1416	1427	1438	1450	1478	1500	
	.14	$ 1551	1568	1579	1591	1602	1613	1630	1642	1653	1664	1692	1715	BALANCE POINT 18 DEG.F.
	.16	$ 1760	1777	1788	1799	1811	1822	1839	1850	1862	1873	1901	1924	
70,000		$ 541	620	694	773	852	931	1010	1083	1162	1241	1393	1551	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 671	694	716	739	761	784	806	829	852	874	919	959	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 778	801	823	846	869	891	914	936	959	981	1026	1066	
	.07	$ 880	902	925	947	970	993	1015	1038	1060	1083	1128	1168	
	.08	$ 987	1010	1032	1055	1077	1100	1122	1145	1168	1190	1235	1275	
	.09	$ 1089	1111	1134	1156	1179	1201	1224	1247	1269	1292	1337	1376	
	.10	$ 1196	1218	1241	1263	1286	1309	1331	1354	1376	1399	1444	1484	
	.12	$ 1405	1427	1450	1473	1495	1517	1540	1563	1585	1608	1653	1692	
	.14	$ 1608	1630	1653	1675	1698	1721	1743	1766	1788	1811	1856	1895	BALANCE POINT 22 DEG.F.
	.16	$ 1816	1839	1862	1884	1907	1929	1952	1974	1997	2020	2065	2104	
80,000		$ 620	705	795	885	976	1060	1151	1241	1331	1416	1596	1771	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 756	784	806	835	857	885	908	936	959	987	1038	1089	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 874	902	925	953	976	1004	1026	1055	1077	1105	1156	1207	
	.07	$ 993	1021	1043	1072	1094	1122	1145	1173	1196	1224	1275	1326	
	.08	$ 1105	1134	1156	1184	1207	1235	1258	1286	1309	1337	1388	1439	
	.09	$ 1224	1252	1275	1303	1326	1354	1376	1405	1427	1455	1506	1557	
	.10	$ 1342	1371	1393	1421	1444	1472	1495	1523	1546	1574	1625	1676	
	.12	$ 1574	1602	1625	1653	1675	1704	1726	1754	1777	1805	1856	1907	
	.14	$ 1805	1833	1856	1884	1907	1935	1957	1986	2008	2036	2087	2138	BALANCE POINT 25 DEG.F.
	.16	$ 2042	2070	2093	2121	2144	2172	2194	2223	2245	2273	2324	2375	
90,000		$ 694	795	897	998	1094	1196	1297	1393	1495	1596	1794	1997	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 812	857	897	942	981	1026	1066	1111	1151	1196	1280	1365	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 914	959	998	1043	1083	1128	1168	1213	1252	1297	1382	1467	
	.07	$ 1015	1060	1100	1145	1184	1230	1269	1314	1354	1399	1484	1568	
	.08	$ 1117	1162	1201	1247	1286	1331	1371	1416	1455	1500	1585	1670	
	.09	$ 1224	1269	1309	1354	1393	1438	1478	1523	1563	1608	1692	1777	
	.10	$ 1326	1371	1410	1455	1495	1540	1579	1625	1664	1709	1794	1878	
	.12	$ 1534	1579	1619	1664	1704	1749	1788	1833	1873	1918	2003	2087	
	.14	$ 1737	1783	1822	1867	1907	1952	1991	2036	2076	2121	2206	2290	BALANCE POINT 28 DEG.F.
	.16	$ 1946	1991	2031	2076	2115	2161	2200	2245	2285	2330	2415	2499	
100,000		$ 773	885	998	1105	1218	1331	1438	1551	1664	1771	1997	2217	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 891	942	987	1032	1083	1128	1173	1224	1269	1314	1410	1500	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1004	1055	1100	1145	1196	1241	1286	1337	1382	1427	1527	1613	
	.07	$ 1117	1168	1213	1258	1309	1354	1399	1450	1495	1540	1636	1726	
	.08	$ 1230	1280	1326	1371	1421	1467	1513	1563	1608	1653	1749	1839	
	.09	$ 1342	1393	1438	1484	1534	1579	1625	1675	1721	1766	1862	1952	
	.10	$ 1455	1506	1551	1596	1647	1692	1737	1788	1833	1878	1974	2065	
	.12	$ 1681	1732	1777	1822	1873	1918	1963	2014	2059	2104	2200	2290	
	.14	$ 1907	1957	2003	2048	2099	2144	2189	2240	2285	2330	2426	2516	BALANCE POINT 31 DEG.F.
	.16	$ 2132	2183	2228	2273	2324	2369	2415	2465	2510	2556	2652	2742	
110,000		$ 852	976	1094	1218	1342	1461	1585	1709	1828	1952	2194	2443	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 931	1004	1077	1151	1224	1297	1371	1444	1517	1591	1737	1878	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1015	1089	1162	1235	1309	1382	1455	1529	1602	1675	1822	1963	
	.07	$ 1100	1173	1247	1320	1393	1467	1540	1613	1687	1760	1907	2048	
	.08	$ 1184	1258	1331	1405	1478	1551	1625	1698	1771	1845	1991	2133	
	.09	$ 1269	1342	1416	1489	1563	1636	1709	1783	1856	1929	2076	2217	
	.10	$ 1354	1427	1500	1574	1647	1721	1794	1867	1941	2014	2161	2302	
	.12	$ 1529	1602	1675	1749	1822	1895	1969	2042	2115	2189	2336	2477	
	.14	$ 1698	1771	1845	1918	1991	2065	2138	2211	2285	2358	2505	2646	BALANCE POINT 33 DEG.F.
	.16	$ 1867	1941	2014	2087	2161	2234	2307	2381	2454	2527	2674	2815	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
										<--ELECTRIC RATE $/KWH
$	216	260	303	346	390	433	520	607	693	<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 60UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 60UHPQA — INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70

ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, HSPF 7.50 MIN.DHR REG IV

BTUH (17) 35500, COP(17) 2.20

FURNACE TYPE FUEL OIL — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. RATE $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
60,000		$ 671	767	863	959	1055	1151	1247	1342	1438	1534	1630	1726	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 648	665	682	705	722	739	756	773	789	812	829	846	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 750	767	784	806	823	840	857	874	891	914	931	947	
	.07	$ 857	874	891	914	931	947	964	981	998	1021	1038	1055	
	.08	$ 959	976	993	1015	1032	1049	1066	1083	1100	1122	1139	1156	
	.09	$ 1066	1083	1100	1122	1139	1156	1173	1190	1207	1230	1247	1263	
	.10	$ 1168	1184	1201	1224	1241	1258	1275	1292	1309	1331	1348	1365	
	.12	$ 1376	1393	1410	1433	1450	1467	1484	1500	1517	1540	1557	1574	
	.14	$ 1581	1608	1625	1647	1664	1681	1698	1715	1734	1754	1771	1788	BALANCE POINT 19 DEG.F.
	.16	$ 1799	1816	1833	1856	1873	1890	1907	1924	1941	1963	1980	1997	
70,000		$ 784	891	1004	1117	1230	1342	1455	1568	1675	1788	1901	2014	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 744	773	806	840	868	902	936	964	998	1032	1060	1094	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 852	880	914	947	976	1010	1043	1072	1105	1139	1168	1201	
	.07	$ 953	981	1015	1049	1077	1111	1145	1173	1207	1241	1269	1303	
	.08	$ 1060	1089	1122	1156	1184	1218	1252	1280	1314	1348	1376	1410	
	.09	$ 1162	1190	1224	1258	1286	1320	1354	1382	1416	1450	1478	1512	
	.10	$ 1269	1297	1331	1365	1393	1427	1461	1489	1523	1557	1585	1619	
	.12	$ 1478	1506	1540	1574	1602	1636	1670	1698	1732	1766	1794	1828	
	.14	$ 1681	1709	1743	1777	1805	1839	1873	1901	1935	1969	1997	2031	BALANCE POINT 22 DEG.F.
	.16	$ 1890	1918	1952	1986	2014	2048	2082	2110	2144	2178	2206	2240	
80,000		$ 891	1021	1151	1280	1405	1534	1664	1788	1918	2048	2172	2302	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 835	874	908	947	981	1021	1055	1094	1128	1168	1201	1235	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 953	993	1026	1066	1100	1139	1173	1213	1247	1280	1320	1354	
	.07	$ 1072	1111	1145	1184	1218	1258	1292	1331	1365	1399	1438	1472	
	.08	$ 1184	1224	1258	1297	1331	1371	1405	1444	1478	1512	1551	1585	
	.09	$ 1303	1342	1376	1416	1450	1489	1523	1563	1596	1636	1670	1704	
	.10	$ 1421	1461	1495	1534	1568	1608	1642	1681	1715	1749	1788	1822	
	.12	$ 1655	1692	1726	1764	1799	1839	1873	1912	1946	1980	2020	2053	
	.14	$ 1881	1924	1957	1997	2031	2070	2104	2144	2178	2211	2251	2285	BALANCE POINT 25 DEG.F.
	.16	$ 2121	2161	2194	2234	2268	2307	2341	2381	2415	2448	2488	2522	
90,000		$ 1004	1151	1292	1438	1579	1726	1873	2014	2161	2302	2448	2589	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 947	1004	1066	1128	1190	1252	1309	1371	1433	1495	1557	1613	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1049	1105	1168	1230	1292	1354	1410	1472	1534	1596	1658	1715	
	.07	$ 1151	1207	1269	1331	1393	1455	1512	1574	1636	1698	1760	1816	
	.08	$ 1254	1309	1371	1433	1495	1557	1613	1675	1737	1799	1862	1918	
	.09	$ 1359	1416	1478	1540	1602	1664	1721	1783	1845	1907	1969	2025	
	.10	$ 1461	1517	1579	1642	1704	1766	1822	1884	1946	2008	2070	2127	
	.12	$ 1670	1726	1788	1850	1912	1974	2031	2093	2155	2217	2279	2336	
	.14	$ 1873	1949	1991	2053	2115	2178	2234	2296	2358	2420	2482	2539	BALANCE POINT 28 DEG.F.
	.16	$ 2082	2138	2200	2262	2324	2386	2443	2505	2567	2629	2691	2747	
100,000		$ 1117	1280	1438	1596	1760	1918	2076	2240	2398	2561	2719	2877	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1038	1105	1173	1241	1309	1376	1444	1512	1579	1647	1715	1783	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1151	1218	1286	1354	1421	1489	1557	1625	1692	1760	1828	1895	
	.07	$ 1263	1331	1399	1467	1534	1602	1670	1737	1805	1873	1941	2008	
	.08	$ 1376	1444	1512	1579	1647	1715	1783	1850	1918	1986	2053	2121	
	.09	$ 1489	1557	1625	1692	1760	1828	1895	1963	2031	2099	2166	2234	
	.10	$ 1602	1670	1737	1805	1873	1941	2008	2076	2144	2211	2279	2347	
	.12	$ 1828	1895	1963	2031	2099	2166	2234	2302	2369	2437	2505	2573	
	.14	$ 2053	2121	2189	2257	2324	2392	2460	2527	2595	2663	2731	2798	BALANCE POINT 31 DEG.F.
	.16	$ 2279	2347	2415	2482	2550	2618	2685	2753	2821	2889	2956	3024	
110,000		$ 1230	1405	1579	1760	1935	2110	2285	2465	2640	2815	2990	3165	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1156	1263	1371	1472	1579	1687	1788	1895	1997	2104	2211	2313	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1241	1348	1455	1557	1664	1771	1873	1980	2082	2189	2296	2398	
	.07	$ 1326	1433	1540	1642	1749	1856	1957	2065	2166	2273	2381	2482	
	.08	$ 1410	1517	1625	1726	1833	1941	2042	2149	2251	2358	2465	2567	
	.09	$ 1495	1602	1709	1811	1918	2025	2127	2234	2336	2443	2550	2652	
	.10	$ 1579	1687	1794	1895	2003	2110	2211	2319	2420	2527	2635	2736	
	.12	$ 1754	1862	1969	2070	2178	2285	2386	2494	2595	2702	2810	2911	
	.14	$ 1924	2031	2138	2240	2347	2454	2556	2663	2764	2872	2979	3080	BALANCE POINT 33 DEG.F.
	.16	$ 2093	2200	2307	2409	2516	2623	2725	2832	2934	3041	3148	3250	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	216	260	303	346	390	433	520	607	693	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

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BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 4 — 60UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 60UHPQA (INDOOR A61AQ-A)

ARI RATED COOLING CAP.: BTUH(95°) 58000, SEER 10.70

ARI RATED HEATING CAP.: BTUH (47°) 61000, COP(47°) 3.20, HSPF 7.50 MIN.OVER REG IV

BTUH (17°) 35900, COP(17°) 2.20

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	PROPANE GAS COST - $/GALLON .60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20	
60,000		$ 874	947	1021	1094	1168	1241	1314	1388	1461	1608	1754	1754	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 688	699	716	727	744	756	767	784	795	823	852	852	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 789	801	818	829	846	857	868	885	897	925	953	953	
	.07	$ 897	908	925	936	953	964	976	993	1004	1032	1060	1060	
	.08	$ 998	1010	1026	1038	1055	1066	1077	1094	1105	1134	1162	1162	
	.09	$ 1105	1117	1134	1145	1162	1173	1184	1201	1213	1241	1269	1269	
	.10	$ 1207	1218	1235	1247	1263	1275	1286	1303	1314	1342	1371	1371	
	.12	$ 1416	1427	1444	1455	1472	1484	1495	1512	1523	1551	1579	1579	BALANCE POINT 18 DEG.F.
	.14	$ 1630	1642	1658	1670	1687	1698	1709	1726	1737	1766	1794	1794	
	.16	$ 1839	1850	1867	1878	1895	1907	1918	1935	1946	1974	2003	2003	
70,000		$ 1021	1105	1190	1280	1365	1450	1534	1619	1704	1878	2048	2048	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 812	835	857	885	908	931	959	981	1004	1055	1100	1100	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 919	942	964	993	1015	1038	1066	1089	1111	1162	1207	1207	
	.07	$ 1021	1043	1066	1094	1117	1139	1168	1190	1213	1263	1309	1309	
	.08	$ 1128	1151	1173	1201	1224	1247	1275	1297	1320	1371	1416	1416	
	.09	$ 1230	1252	1275	1303	1326	1348	1376	1399	1421	1472	1517	1517	
	.10	$ 1337	1359	1382	1410	1433	1455	1484	1506	1529	1578	1625	1625	
	.12	$ 1546	1568	1591	1619	1642	1664	1693	1715	1737	1788	1833	1833	BALANCE POINT 22 DEG.F.
	.14	$ 1749	1771	1794	1822	1845	1867	1895	1918	1941	1991	2036	2036	
	.16	$ 1957	1980	2003	2031	2053	2076	2104	2127	2149	2200	2245	2245	
80,000		$ 1168	1263	1365	1461	1567	1658	1754	1850	1952	2144	2341	2341	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 916	942	970	998	1026	1055	1083	1111	1139	1190	1247	1247	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1032	1060	1089	1117	1145	1173	1201	1230	1258	1309	1365	1365	
	.07	$ 1151	1179	1207	1235	1263	1292	1320	1348	1376	1427	1484	1484	
	.08	$ 1263	1292	1320	1348	1376	1405	1433	1461	1489	1540	1596	1596	
	.09	$ 1382	1410	1438	1467	1495	1523	1551	1579	1608	1658	1715	1715	
	.10	$ 1500	1529	1557	1586	1613	1642	1670	1698	1726	1777	1833	1833	
	.12	$ 1731	1760	1788	1816	1845	1873	1901	1929	1957	2008	2065	2065	BALANCE POINT 25 DEG.F.
	.14	$ 1963	1991	2020	2048	2076	2104	2133	2161	2189	2240	2296	2296	
	.16	$ 2200	2228	2257	2285	2313	2341	2369	2398	2426	2477	2533	2533	
90,000		$ 1314	1427	1534	1642	1754	1862	1974	2082	2194	2415	2635	2635	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1077	1122	1168	1213	1263	1309	1354	1399	1450	1540	1636	1636	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1179	1224	1269	1314	1365	1410	1455	1500	1551	1642	1737	1737	
	.07	$ 1280	1326	1371	1416	1467	1512	1557	1602	1653	1743	1839	1839	
	.08	$ 1387	1427	1474	1517	1568	1613	1658	1704	1754	1845	1941	1941	
	.09	$ 1489	1534	1579	1625	1675	1721	1766	1811	1862	1952	2048	2048	
	.10	$ 1591	1636	1681	1726	1777	1822	1867	1912	1963	2053	2149	2149	
	.12	$ 1799	1845	1890	1935	1986	2031	2076	2121	2172	2262	2358	2358	BALANCE POINT 28 DEG.F.
	.14	$ 2003	2048	2093	2138	2189	2234	2279	2324	2375	2465	2561	2561	
	.16	$ 2211	2257	2302	2347	2398	2443	2488	2533	2584	2674	2770	2770	
100,000		$ 1461	1585	1704	1828	1952	2070	2194	2313	2437	2680	2928	2928	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1184	1235	1286	1337	1388	1438	1495	1546	1596	1698	1805	1805	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1297	1348	1399	1450	1500	1551	1608	1658	1709	1811	1918	1918	
	.07	$ 1410	1461	1512	1563	1613	1664	1721	1771	1822	1924	2031	2031	
	.08	$ 1523	1574	1625	1675	1716	1777	1833	1884	1935	2036	2144	2144	
	.09	$ 1636	1687	1737	1788	1839	1890	1946	1997	2048	2149	2257	2257	
	.10	$ 1749	1799	1850	1901	1952	2003	2059	2110	2161	2262	2369	2369	
	.12	$ 1974	2025	2076	2127	2178	2228	2285	2336	2386	2488	2595	2595	BALANCE POINT 31 DEG.F.
	.14	$ 2200	2251	2302	2352	2403	2454	2510	2561	2612	2714	2821	2821	
	.16	$ 2426	2477	2527	2578	2629	2680	2736	2787	2838	2939	3047	3047	
110,000		$ 1608	1743	1878	2008	2144	2279	2415	2550	2680	2951	3216	3216	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1382	1467	1546	1625	1704	1783	1867	1946	2025	2183	2347	2347	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1467	1551	1630	1709	1788	1867	1952	2031	2110	2268	2431	2431	
	.07	$ 1551	1636	1715	1794	1873	1952	2036	2115	2194	2352	2516	2516	
	.08	$ 1636	1721	1799	1878	1957	2036	2121	2200	2279	2437	2601	2601	
	.09	$ 1721	1805	1884	1963	2042	2121	2206	2285	2364	2522	2685	2685	
	.10	$ 1805	1890	1969	2048	2127	2206	2290	2369	2448	2606	2770	2770	
	.12	$ 1980	2065	2144	2223	2302	2381	2465	2544	2623	2781	2945	2945	BALANCE POINT 33 DEG.F.
	.14	$ 2149	2234	2313	2392	2471	2550	2635	2714	2793	2951	3114	3114	
	.16	$ 2319	2403	2482	2561	2640	2719	2804	2883	2962	3120	3284	3284	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
$	216	260	303	346	390	433	520	607	693	<--THEORETICAL AIR CONDITIONING COST

<--ELECTRIC RATE $/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.